EFFECTIVENESS OF TAILORED EXERCISE PROGRAM ON LEVELS OF PHYSICAL PERFORMANCE, MOBILITY AND FALLS EFFICACY AMONG ELDERLY IN A SELECTED OLD AGE HOME, VELLORE.

M.Sc (NURSING) DEGREE EXAMINATION

BRANCH- I MEDICAL SURGICAL NURSING

SRI NARAYANI COLLEGE OF NURSING,

VELLORE-55.

A Dissertation Submitted to

THE TAMIL NADU DR. M. G. R. MEDICAL UNIVERSITY,

CHENNAI- 600 032.

In partial fulfilment of the requirement for the degree of

MASTER OF SCIENCE IN NURSING.

APRIL -2016

CERTIFICATE

This is to certify that this dissertation entitled **"EFFECTIVENESS OF TAILORED EXERCISE PROGRAM ON LEVELS OF PHYSICAL PERFORMANCE, MOBILITY AND FALLS EFFICACY AMONG ELDERLY IN A SELECTED OLDAGE HOME,VELLORE"** is a bonafide work done by **Ms. PERSIS ANGELIN.W,** Sri Narayani College of Nursing, Vellore – 55, in the partial fulfilment of the requirement for award of the degree of Master of Science in Nursing, Branch I – Medical Surgical Nursing, under my guidance and supervision during the academic Period from April 2014-16.

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ABSTRACT

INTRODUCTION

Old age is the golden age and often referred to as second childhood. Elderly require special care during this period.

STATEMENT

Effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy among elderly in a selected old age home, Vellore.

OBJECTIVES :

- To assess the levels of physical performance, mobility and falls efficacy before tailored exercise program among elderly.
- To assess the effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy among elderly.
- To associate the post tet level of physical performance, mobility and falls efficacy with the selected demographic variables among elderly

METHODS:

The research design selected was pre experimental one group pre and post test design. Purposive sampling Technique was adopted to select 30 elderly in old age home. Descriptive statistics and inferential statistics were used for analysis and interpretation of data.

Results and interpretation:

The study findings revealed that the pre test mean value of physical performance was 23, elderly mobility was 16, falls efficacy was 28 and after the tailored exercise program the post test mean value of physical performance was 24.7, and mobility was 17, falls efficacy 43.7. The paired "t" value of physical performance (3.3) is greater than the table value (2.76) which was statistically significant at $p < 0.01$ level. The paired "t" value of mobility (5.3) is greater than the table value (2.76) which was statistically significant at $p < 0.01$ level. The paired "t" value of falls efficacy (12.7) is greater than the table value (2.76) which was statistically significant at $p < 0.01$ level proving effectiveness of tailored exercise program on physical performance, mobility and falls efficacy. The 'Chi' square value of demographic variable of physical performance (history of falls) , elderly mobility (history of falls, period of falls), falls efficacy (BMI , education, co-morbid illness) are significant at $p < 0.05$ level.

Conclusion:

The majority of the elderly in old age home had significant improvement in the levels of physical performance, mobility and falls efficacy through tailored exercise program.

Key words : Effectiveness, Tailored exercise program, levels of physical performance, mobility and falls efficacy.

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LIST OF ABBREVATIONS.

ADL	Activity Of Daily Living
ANA	National Health Services
BBS	Berg Balance Scale
BMI	Body Mass Index
CI	Confidence Interval
CG	Control Group
DHGS	American Nursing Association
EE	Education plus Exercise
EO	Exercise Only
FES	Falls Efficacy Scale
FGS	Dominant Hand Grip Strength
FOF	Fear Of Falls
FRT	Functional Reach Test
GST	Gait Speed Test
IRR	Incidence Rate Ratio

MHR	Multivariate Hazards Ratio
NHS	Fast Gait Speed
OR	Odds Ratio
PG	Pilates Group
PNFG	Proprioceptive Neuromuscular Facilitation Group
PRB	Population Reference Bureau
RM	Repetition Maximum
RR	Rate Ratio
SBT	Static Balance Test
SPPB	Short Physical Performance Battery
TBI	Traumatic Brain Injury
TST	Ten Step Test
TUG	Time Up and Go Test
UK	United Kingdom
WHO	World Health Organization
YLD	Years Lived with Disability
6MW	6 Minute Walk Test

CHAPTER-I

INTRODUCTION

"Even to your old age I am He, and to gray hair I will carry you. I have made, and I will bear; I will carry and I will save".

- PSALM 71:18

Old age is the golden age and often referred to as second childhood. They require special care during this period. Historically societies have reacted to their aged members in a variety of ways. In the time of Confucius (Chinese philosopher) there was a direct correlation between a person's age and degree of respect to which he or she is entitled.

Indian Ashrama system says Youth was considered enjoyment of life, while old age was considered the age of renunciation and liberation.

Taoism (Chinese philosophy by Lao-Tzu) viewed old age as a epitome of life. Chinese believed old age was a wonderful accomplishment that deserved a great honor. Recent years have found that the life expectancy of elderly in the society has increased. This made awareness to the government and non government health professionals to take care of elderly health and improve care in holistic approach, So elderly have the opportunity to attain old age and live longer than the previous generations.

841 millions of elderly population constitute 11% of the total population of the world (2013). This population will grow to 2 billion by 2050, that is 22% of the total world population. The share of elderly aged 80 years or over within the elderly population was 14% in 2013 and is projected to reach 19% in 2050.

Compared to developing countries, India can be considered 'Young', with a vast majority of working age population. This advantage gives us the time to plan and introduce policy initiatives and programmes to address these issues and prepare the society for this demographic transition. **(Population Reference Bureau PRB-2014)** .

In India Population ageing as per 2001 census states that there are 8 crores of elderly people. By 2030 this will reach nearly 20 crores **International Longevity Centre India. (2012)**

INDIA'S population is likely to increase by 60% between 2000 to 2050 but the number of elders, who attained 60 years of age will increase three fold. India has around 100 million of at present and it will increase to 323 million in 2050, constituting 20% of total population. **United Nation Population Fund Report (2012)**

A study in India, which was conducted in seven states, found that around one-fifth of the elderly live alone or with spouses only in both rural and urban areas. 70 per cent of the elderly population are illiterate. In order to realise their right to enjoy the highest attainable standard of physical and mental health, elder persons must have access to age-friendly and affordable information and services that meet their demands. **(Chandrapaul 2012)**

According to the census 2011, the state's population is 7.2 crore and elderly constitute nearly 8.8% of population. Female elderly population is more than the male elderly population. Due to urbanization elderly are seen more in rural than in urban areas as the population ratio is more in rural compared with the urban. So it places a challenge for the health care professionals to render health care services.

Growing old is a lonely business anywhere, but more so in Tamil Nadu than elsewhere in the country. The state has the highest number and proportion of elderly people living on their own, especially elderly because they are increasingly vulnerable with advancing age, do not have the support provided by other family members such as help with household chores and other daily activities. Roughly one out of every 14 people aged over 60 in Tamil Nadu, 7.5% to be precise lives all by himself or herself. **(National health mission Tamil Nadu 2011)**

Vellore population is 39,28,106 and elderly population consist of 20% . In that 12% of the elderly are women and 8% are men. **(Vellore population report 2011**).

Old age home practices is an western practice which has been adopted in developing countries. Developed countries have more old age homes due to their nuclear family but it is now well established even in the developing countries. There are 850 Old Age Homes in India today. **(Directory of Old Age Homes in India, Help Age India, 2013)**

In Tamilnadu there are about 200 old age home where Chennai alone has more than 40 old age homes. There are about 15 old age homes in Vellore which are authorized. (**Tamilnadu portal.org - 2012)**

Physical performance and mobility are related to each other. They decrease with the ageing process and elderly often have the problems associated with physical activity, psychological activity and mobility which contributes to falls. Chronic conditions along with aging will have an influence on mobility through various mechanisms influencing the musculoskeletal, neurological such as Alzheimer's and dementia which affects the musculoskeletal activities or cardio respiratory systems.

Musculoskeletal pain is common among older people due to ageing and is associated with impaired balance and mobility limitations**. (National Institute of Ageing 2014)**

Elderly are prone to have falls, elderly women have a higher rates of injuries than any other women age group. Approximately 28-35% of people aged of 65 and over, fall each year increasing to 32-42% for those over 70 years of age. The frequency of falls increases with age and frailty. Falls result from many factors that include both extrinsic or environmental factors and intrinsic factors such as muscle weakness, impairment in balance, decline in physical functioning, nutritional imbalance, impairments to the sensory nervous system, disorders of musculoskeletal system and specific diseases, social and behavioral factors. Environmental hazards may also predispose older people to falls. A history of falling is a significant risk factor for future falls. **(WHO 2013)**

Approximately 30% of people over 65 years of age who live in the community fall each year. Deaths from falls also occur for people over the age of 65 years with one study finding 2 deaths occurring for every 100 fall injury events admitted to acute medical facilities.

The rate of hospital admission due to falls for people at the age of 60 and older in Australia, United Kingdom, Canada range from 1.6 to 3.0 per 10,000 population. 7 to 10% of elderly in India fall annually and admitted in casualty. Elderly are at high risk of fall than any other population. As the age increases the fear of falling increases whereby, the falls efficacy is also decreased.

Studies have been proved that exercise program is being effective in prevention of falls. In the past decade, numerous studies have been conducted to investigate the effectiveness of falls preventive interventions. Exercise plays a major role in preventing falls in elderly.

Beside there are many contributing factors to falls but exercise program plays an vital role in managing physiological factors which contribute to falls. Regular physical activity is also associated with decreased mortality and age-related morbidity in elderly. Exercise training in elderly led to improvement in functional reach, balance and fear of falling**.(American Geriatrics Society-2013)**

Many exercise program are effective in improving physical performance, mobility in which balance, strengthening and flexibility exercises are simple that can be followed by the elderly. These exercises are followed by the elderly in United Kingdom which is followed by all the countries. These exercises are proved to be effective and practiced with elderly. **(NHS CHOICES- UK 2012)**

NEED FOR THE STUDY

831 Elderly population constitute 11% of the total population of the world. At present 95 million people in India are above the age of 60, by the year 2025 nearly 80 million more will be added to this population. With improved life expectancy rate in our country, it is estimated that as many as 8 million people are currently above the age of 80 years. Changing family value system, economic compulsions of the children, neglect and abuse has caused elders to fall through the net of family care. Homes for the Aged are ideal for elderly people who are alone, face health problems, depression and loneliness. **(Population Reference Bureau PRB 2013)**

Over 20% of adults aged 60 and over are suffering from a mental or neurological disorder (excluding headache disorders). About 6.6% of all disability among elderly over 60 years are attributed to neurological and mental disorders. These disorders in the elderly population account for 17.4% of Years Lived with Disability (YLDs). The most common neuropsychiatric disorders in this age group are dementia and depression. These mental or neurological disorders affect the physical state of elderly. **(World Health Organization 2013)**

Physical performance and mobility are decreased due to the ageing process. These two factors overlap with each other which ultimately lead to falls causing serious injury to the elderly. Muscle weakness, especially in the legs, is one of the most important risk factors. Elderly with weak muscles are more likely to fall than are those who maintain their muscle strength, as well as their flexibility and endurance.

Balance and gait are other key factors. Elderly who have poor balance or difficulty walking are more likely than others to fall. These problems may be linked to a lack of exercise, neurological cause, arthritis, or other medical conditions and their treatments.

Falls don't "just happen," and people don't fall because they get older. Often, more than one underlying cause or risk factor is involved in a fall. A risk factor is something that increases a person's risk or susceptibility to a medical problem or disease.

As the number of risk factors rise, so does the risk of falling. Many falls are linked to a person's physical condition or a medical problem, such as a cataract, Alzheimer's, dementia, hypertension etc. Other causes could be safety hazards in the person's home or community environment.

Blood pressure that drops too much when getting up from lying down or sitting can increase the chance of falling. This condition called postural hypotension and might result from dehydration, or certain medications. It might also be linked to diabetes, neurological conditions such as Parkinson's disease, or an infection, wearing unsafe footwear also increase the chance of falling. Sensory problems contribute to falls. Sensory losses cause less awareness of environment which leads to falls. Elderly mostly have visual problems which make them prone to fall. Other vision problems contributing to falls include poor depth perception, cataracts, and glaucoma. Wearing multi-focal glasses while walking or having poor lighting around home can also lead to falls.

Confusion, even for a short while, can sometimes lead to falls. Some medications can increase a person's risk of falling because they cause side effects like dizziness or confusion. The health problems for which the person takes the medications may also contribute to the risk of falls.

20 to 30 % of people who fall suffer moderate to severe injuries such as lacerations, hip fractures, and head injuries. These injuries can make it hard to get around or live independently, and increase the risk of early death. Falls are the most common cause of traumatic brain injuries (TBI). About one-half of fatal falls among older adults are due to TBI. Most fractures among older adults are caused by falls. The most common are fractures of the spine, hip, forearm, leg, ankle, pelvis, upper arm, and hand. Many people, who fall, even if they are not injured, develop a fear of falling. This fear may cause them to limit their activities, which leads to reduced mobility and loss of physical fitness, and in turn increases their actual risk of falling. Falls are the leading cause of injury deaths among older adults. **(National Centre for injury prevention and control 2012)**

Approximately 28-35% of people aged of 65 and over fall each year (2-4) increasing to 32-42% for those over 70 years of age. The frequency of falls increases with age and frailty level. Older people who are living in nursing homes fall more often than those who are living in community. Approximately 30-50% of people living in long-term care institutions fall each year, and 40% of them experienced recurrent falls. The incidence of falls appears to vary among countries as well. **(WHO global report on falls prevention- 2013)**

For instance, a study in the South-East Asia Region found that in China, 6-31% (9-13) while another, found that in Japan, 20% (14) of older adults fell each year.

A study in the Region of the Americas (Latin/Caribbean region) found the proportion of older adults who fell each year ranging from 21.6% in Barbados to 34% in Chile. **(WHO global report on falls prevention - 2013)**

In Canada the injury rate of falls increases with age from 35 per 1000 population for people age 65-69 to 76 per 1000 population for people age 80 and over. For ages 65 and older, the rate of fall injuries (serious enough to limit normal activities) was 47.7 per 1000 population. Rates among women exceed those of men for all age groups. These gender differences are statistically significant except for ages 75-79 **(Canadian Association of falls prevetion-2013)**

In Britain falls are the commonest cause of accidental injury in older people and the commonest cause of accidental death in the 75+ population. About 6% of falls in those over 65 result in a fracture, including 1% being of the hip. Having fallen is the commonest reason for older people to attend the emergency department and for being admitted to hospital. Injury occurs more commonly in frailer persons and the nature of the fall affects injury risk and type. Hip fractures predominate after 60 years of age**. (British Geriatrics Society 2012)**

In United States three-fourths of deaths due to falls occur in the 13% of the population age ≥65. About 40% of this age group living at home will fall at least once each year, and about 1 in 40 of them will be hospitalised. Of those admitted to hospital after a fall, only about half will be alive a year later. Repeated falls and instability are very common precipitators of nursing home admission **(Age and ageing 2012)**

In developing countries falls account for 10 percent of emergency hospital visits and 6 percent of hospital admissions. The incidence of falls increases

exponentially with age, an incidence rate of 30 percent in persons age 65 and over increases to 50 percent in persons age 80 and over. Twenty to 30 percent of older persons who fall suffer serious injury, such as hip and other fractures, dislocations, subdural haematoma, head injury and other soft tissue injuries. More than 60 percent of people who die from falls are age 75 and over. Those who survive a fall suffer significant morbidity with greater functional decline in activities of daily living (ADLs) and physical and social activities, and are at a greater risk of institutionalisation, than person's age 65–74 years. Falls that do not result in serious injury may still have serious consequences for an older person, who may fear falling again, which can lead to reduced mobility and increased dependence through loss of confidence. Multifaceted fall prevention programs which address interacting risk factors for falls have been shown to be successful in reducing falls and fall related injuries in both community dwelling and institutionalised individuals when offered by trained professionals. Implementation of falls prevention programs in developing countries will be challenging in terms of costs, other priorities, and a lack of awareness of the complexity of falls. **(WHO global report on falls 2013)**

In India the death rates from falls among older men and women have risen sharply over the past decade. In 2013, about 25,500 older adults died from unintentional fall injuries. Men are more likely than women to die from a fall. After taking age into account, the fall death rate is approximately 40% higher for men than for women. Rates of fall-related fractures among older women are twice more than those for men. Over 95% of hip fractures are caused by falls each year, there are over 258,000 hip fractures and the rate for women is almost twice the rate for men.

Falls form a major problem in country as they increase morbidity and mortality rates. Exercise program forms an effective way in preventing falls in elderly. **(Geriatric society of India 2013).**

In Vellore about 30% of elderly are admitted to the emergency department due to falls. Women are admitted more than the male due to the bone degenerative disorder and muscle weakness. **(Elderly morbidity report- IOSR journals 2012)**

In Sri Narayani Hospital and Research Centre more than 20 elderly are admitted in Ortho department due to falls. They are mostly presented with fracture of femur and hip fracture. Most of the history reveals that they fall early morning.

Exercise programs reduced falls that caused injuries by 37%, falls leading to serious injuries by 43%, and broken bones by 61%. Balance exercises, strengthening exercise, Tai chi exercise, endurance exercise, calisthenic exercise, flexibility exercise are some of the exercises for elderly to prevent falls. Balance, strengthening and flexibility exercise are effective and simple to be followed by the elderly in the home care environment. **(Harvard Health Publications -2013).**

During the clinical posting researcher had personal experience where elderly had fracture due to falls. The contributing factors were both intrinsic and extrinsic factors. Researcher had an interest to find out the intervention for prevention of falls. When searching for the elderly articles many issues were mainly concerned with the falls and its prevention. This strongly gave an confidence to researcher to conduct study regarding falls. Many studies prove that exercise program had a positive result in fall prevention, efficacy by strengthening the muscles. Researcher decided to concentrate on sitting, balance and strengthening exercise which will improve physical performance, mobility and falls efficacy.

The purpose of the current study was to determine the impact of a 5 week exercise program (consisting 30 minutes of duration) on physical performance, mobility and falls efficacy.

STATEMENT OF THE PROBLEM:

Effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy among elderly in a selected old age home, Vellore.

OBJECTIVES

1. To assess the levels of physical performance, mobility and falls efficacy before tailored exercise program among elderly.
2. To assess the effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy among elderly.
3. To associate the post test level of physical performance, mobility and falls efficacy and the selected demographic variables among elderly.

OPERATIONAL DEFINITIONS.

EFFECTIVENESS: It refers to the significant difference in the levels of physical performance, mobility and falls efficacy before and after tailored exercise program.

TAILORED EXERCISE PROGRAM: It refers to the type of exercises that includes flexibility, strengthening and balancing exercises adopted for the purpose of study performed for 30 minutes (3 days in a week) for a period of 5 weeks demonstrated by the researcher.

Flexibility exercise: It refers to the neck rotating, neck stretching, sideways bending of hip, calf stretching exercise which are done for 8 minutes (two minutes for each exercise with 6 times each minute).

Strengthening exercise: It refers to sitting to standing, mini squatting, calf raising, sideways leg lifting, wall pressing by hand, leg extension exercise which are done for 12 minutes. (two minutes for each exercise with 6 times each minute).

Balancing exercise : It refers to sideways walking, simple grapevine, heel to toe walking, one leg standing, stepping up exercise which are don for 10 minutes (two minutes for each exercise with 6 times each minute).

PHYSICAL PERFORMANCE: It refers to the ability to perform a physical task in day today activities assessed before and after the intervention measured by **Brown's Modified physical performance scale.**

MOBILITY: It refers to the capability to move in ones environment with ease and without restriction and walking aids which is measured by Smith's **Elderly mobility scale.**

FALLS EFFICACY: It refers to the beneficial change of elderly about their possibility of preventing fall as measured by **Tinette's Falls efficacy scale** .

ELDERLY: It refers to the persons who are aged 60 and above admitted in selected Old age home Arcot , Vellore.

OLD AGE HOME: It refers to the place where elderly people are assisted cared and supervised at Mahatma Gandhi Old Age Home located at Arcot, Vellore.

Delimitation:

The study is limited to Elderly who are

- Aged 60 and above.
- Residing at selected old age home.

H**YPOTHESES**

- **H_1**: There is a significant difference in levels of physical performance before and after tailored exercise program.
- **H_2:** There is a significant difference in levels of mobility before and after tailored exercise program.
- **H_3:** There is a significant difference in levels of fall efficacy before and after tailored exercise program.
- **H_4:** There is a significant association between post test levels of physical performance and the selected demographic variables.
- **H_5:** There is a significant association between post test levels of mobility and the selected demographic variables.
- **H_6:** There is a significant association between post test levels of falls efficacy and the selected demographic variables.

CONCEPTUAL FRAMEWORK

Theory is a set of interrelated concepts that gives a view of a phenomenon that is explanatory and predictive in nature**. (Fred N. Kerlinger -1986)**

The present study is aimed at helping the elderly to improve their physical performance, mobility and falls efficacy. Hence this study is based on Ernestine Wiedenbach's prescriptive theory (1964). According to Wiedenbach's, the practice of nursing compromises a wide range of services, each directed towards the attainment of one of its three components.

Step I: Identification of need for help :

a) General information: In this theory, it includes to obtain consent and assess the existing level of physical performance, mobility and falls efficacy among elderly living in old age homes.

b) The central purpose : It refers to what the investigator wants to accomplish. Here the central purposes are to improve the physical performance, mobility and falls efficacy among elderly.

Step II : Ministering the needed help. It refers to the provision of needed help.

Realities: It refers to physical, physiological, emotional and spiritual factors that come in play with situation involving the nursing action.

Wiedenbach's defines the five realities which include:

a) AGENT: The person who is providing care to elderly characterized by personal attributes, proficiency, commitments and competence in providing nursing action.

b) RECIPIENT: The recipient is the one who receives nursing action. In the present study the recipients are the elderly residing in old age homes.

c) GOAL: The goal is the nurse's desired outcome. It is similar to the central purpose which is to improve physical performance, mobility and falls efficacy .

d) MEANS: They are the activities through which the investigator aims to attain the goal. It includes skill, techniques, procedures and devices that may be used to facilitate nursing practice. Here it refers to the exercise that is done by the elderly in the presence of the researcher.

e) FRAMEWORK : It refers to the facilities in which nursing is practiced. The frame work in this study has been considered as old age home in which the study has been conducted.

Step III : Validating that the needed help was met : It refers to the collection of evidence that shows the need have been met as a direct result of an action. This step involves the post assessment done after group exercise and comparison analysis to infer the outcome. This approach there by enables the investigator to make suitable decisions and take recommended action to continue or modify the nursing action. Here it is the comparison of pre and post test of the intervention level of tailored exercise program on physical performance, mobility and falls efficacy.

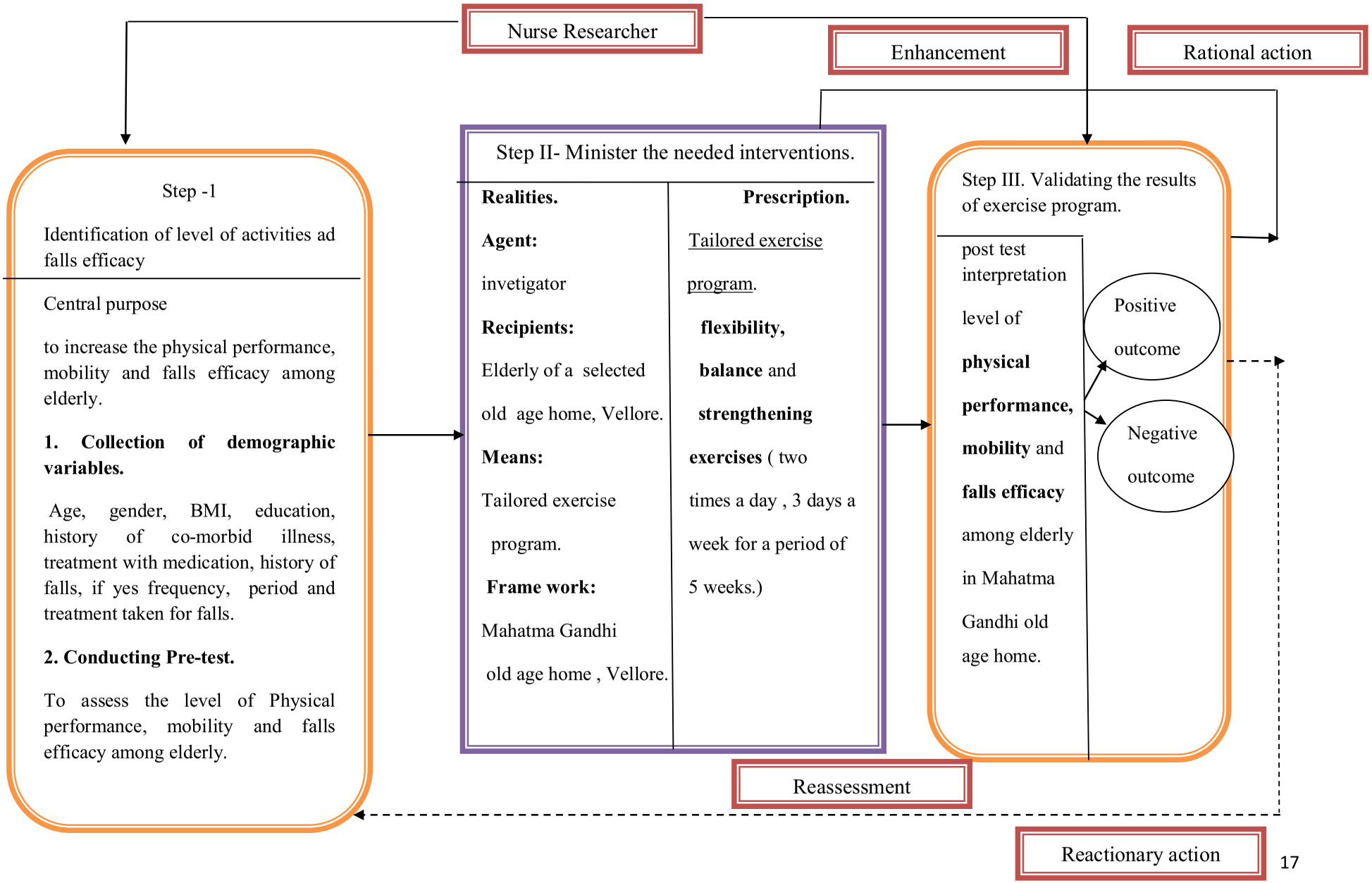


FIG NO. 2 CONCEPTUAL FRAMEWORK BASED ON ERNESTINE WIEDENBACH'S THEORY

CHAPTER II

REVIEW OF LITERATURE.

A literature review is a body of text that aims to review the critical points of knowledge on a particular topic of research. **(ANA -2000)**

Several studies are conducted in relation to tailored exercise program on physical performance, mobility and falls efficacy which needs more focus for the development of future studies. The related literature has been organized under the following headings.

Section (A) Studies related to assessment of Physical performance, Elderly mobility and Falls efficacy.

Section (B) Studies related to effectiveness of tailored exercise program on Physical performance, Mobility and Falls efficacy among elderly.

Section (A) Studies related to assessment of Physical performance and Elderly mobility and Falls efficacy.

Yoshida O, Kawamoto (2015) A pre experimental study was conducted on factors related to physical performance among community dwelling elderly in Tokyo. The objectives of the study were to clarify the relationship between physical performance and background factors in community-dwelling elderly people. Study subjects were 60 community-dwelling persons aged 65. Functional capacity was measured using the 13 items of the Tokyo Metropolitan Institute of Gerontology (TMIG - modified physical performance scale) index for competence (instrumental

self-maintenance, intellectual activity, social role, standing static balance, 50 foot walk test, climb flight of stairs, turn 360 degree). Subjects consisted of 35 men (mean age+/_standard deviation, 73+/_6.5 years) and 25 women (75+/_7.6 years). Functional capacity decreased with age. In particular, functional capacity was markedly decreased in women at highly advanced ages. Multiple logistic regression analysis of functional capacity showed that significantly independent explanatory variables included younger age, good financial condition, participation in community activities, regular physical exercise, absence of prescription medication, absence of hearing impairment, absence of cognitive impairment and physical independence.

Thomas M. Gill MD (2015) conducted a pre experimental study to assess the physical performance and functional dependence in community-dwelling adults aged 75 years and older and lose independence in basic activities of daily living (ADLs) each year. 100 elderly were selected and they were assessed through physical performance scale. Functional dependence developed in 53 (9%) of the 563 subjects who had complete data at the 1-year follow-up. six of the tests were significantly associated ($P < 0.05$) with the onset of functional dependence. Both qualitative and timed performance tests demarcated subjects into groups at low and high risk for functional dependence. Four timed tests chair stands, rapid gait, 360° turn, and bending over showed a threshold phenomenon, where the rate of new dependence increased slowly with worsening performance until a critical point (or threshold) was reached, and the rate of dependence increased substantially. These results support the potential use of physical performance tests to develop a risk assessment strategy that could identify subgroups of older persons, independent in all ADLs, who are at increased risk for functional dependence.

Singh DK Pillai SG (2015) conducted cross-sectional study to find the association between physiological falls risk and physical performance tests among community-dwelling older adults. 100 elderly from old age home in Kuala Lumpur, Malaysia (60 females, 40 males), aged 60 years and above (65.77±4.61), participated in the study. Participants were screened for falls risk using Physical Performance scale. A battery of physical performance tests that include ten-step test (TST), short physical performance battery (SPPB), functional reach test (FRT), static balance test (SBT), dominant hand-grip strength (DHGS), and gait speed test (GST) were also performed. Approximately 13% older adults were at high risk of falls categorized using Physical Performance. Significant differences ($P<0.05$) df=3 7.82 were demonstrated for age, Ten Step Test, Short Physical Performance Battery, Functional Reach Test between high and low falls risk group. A significant ($P<0.01$) weak correlation was found between Physical Performance Test and Ten Step Test ($r=0.25$), Static balance test ($r=0.23$), Short Physical Performance Battery ($r=-0.33$), and Functional Reach Test ($r=-0.23$). Binary logistic regression results demonstrated that Static Balance Test measuring postural sways objectively using a balance board was the only significant predictor of physiological falls risk ($P<0.05$, odds ratio of 2.12).

Aline Rodrigues (2014) conducted a pre experimental study to determine the age and gender differences regarding physical performance in the elderly. 60 elderly were selected in Havan (Cuba). The study was assessed using physical performance scale. The results showed that values (mean ± standard deviations and percentiles) for men were greater than women in handgrip strength and "chair stand" tests ($p\leq0.01$). Increasing age led to both genders having reduced physical performance ($p\leq0.001$) (df=3 20.32). Men had proportionately better scores than women.

Mehmet Yanardag (2013) conducted a comparative study on level of mobility, quality of life, and physical performance of the elderly people living at home and in the nursing homes at Shanghai. The study comprised 50 voluntary elderly participants living in 2 nursing homes and in homes who met the inclusion criteria. Sociodemographic data and medical history of the participants were recorded, and the Elderly Mobility Scale, Barthel Index, and Nottingham Health Profile were administered. The level of mobility of the elderly people living in nursing homes was found to be lower than that of those living at home ($P < 0.05$ df =4 19.49). Quality of life , level of mobility and physical performance were comparingly decreased than elderly living at homes.

Diane and Niamo (2013) conducted a pre experimental study to assess the Basic Functional Mobility for Frail. The study included 50 Elderly Persons in (mean age 79.5 years) nursing homes at Shillong. The elderly were observed arm chair, walks 3 meters, turns, walks back, and sits down again. The results indicate that the time score is reliable (inter-rater and intra-rater); correlates well with log-transformed scores on the Berg Balance Scale ($r = -0.81$), gait speed ($r = -0.61$) and Barthel Index of ADL ($r = -0.78$). Study concluded that elderly had less mobility and physical performance when they become more elderly.

Teresa M Stefen (2012) conducted a pre experimental study to assess the age and gender related changes in performance of elderly at Bengaluru. This study included 50 elderly people in nursing home (61–89 years of age) with independent functioning performed and performed 4 clinical tests. Data were collected on the Six-Minute Walk Test (6MW), Berg Balance Scale (BBS), and Timed Up & Go Test (TUG) fast-speed walking (FGS).

Data were analyzed by gender and age (60–69, 70–79, and 80–89 years) cohorts, similar to previous studies. Means, standard deviations, and 95% confidence intervals for each measurement were calculated for each cohort. The measurements (confidence interval CI [2,1]=.95–.97) mean test scores showed a trend of age-related declines for both male and female subjects. The physical performance and mobility decreased with age in the elderly.

Elena M. Andresen (2015) conducted a cross-sectional study to assess the Risk Factors for Falls, Fear of Falling, and Falls Efficacy. The study was conducted among 60 elderly in nursing homes in Pune. Baseline interview, and baseline fear of falling and falls efficacy with risks for falling was assessed. Age was associated with increased risk of falls. Lower-body functional limitations were associated with prior falls, baseline fear of falling, and low falls efficacy, whereas low ability with one-leg stands prospectively predicted fear of falling. The greatest risk for incident falls was having had a prior fall (odds ratio = 2.51), and the greatest risk for fear of falling was having been afraid of falling at baseline (odds ratio = 8.14). Falls, fear of falling, and low falls efficacy are important issues for late-middle-aged as well as older persons.

Kenneth James (2014) conducted a comparative study to estimate Falls Among Community-Dwelling Older Adults. 100 elderly were selected using purposive sampling**.** Increasingly old, rural residents, persons with vision problems (including cataracts), and those with key chronic conditions reported falling in this period compared with those without these respective attributes ($p < .05$ df=3, 20.54). The majority of falls reported, have occurred in the home (54.3%). The mean number of falls in this sample was 1.94 (SD = 1.99).

In terms of demographic variables, a greater proportion of women than men reported having a fall in the past 6 months (χ^2 = 27.26, *df* = 1, $p < .001$). The proportion of the population who reported a fall also increased with age Compared with the young-old, the old-old (Odds Ratio = 1.8; 95% Confidence Interval = [1.4, 2.2]) had the highest odds of falling, followed by the middle-old (OR = 1.5; 95% CI = [1.2, 1.8]). Based on sex-specific age categories, females who were 80 years and above had the highest prevalence (29.8%) of falling in the last 6 months. A larger proportion of rural residents reported falling compared with urban residents (28.6% vs. 19.4%, $\chi^2 = 27.99$, *df* = 1, $p < .001$).

Julie D. Moreland (2014) conducted a systematic Review and meta-Analysis on muscle Weakness and Falls in Older Adults. 50 older adults were in the study aged 65 and above. Studies of institutionalized and community-dwelling subjects were included. The study assessed reliable method of measuring muscle strength, and blinded outcome measurement. Results showed that for lower extremity weakness, the combined Odds Ratio (OR) was 1.76 (95% confidence interval (CI)=1.31–2.37) for any fall and 3.06 (95% Confidence Interval=1.86–5.04) for recurrent falls. For upper extremity weakness the combined OR was 1.53 (95% CI=1.01–2.32) for any fall and 1.41 (95% CI=1.25–1.59) for recurrent falls. Study concludes that Muscle strength (especially lower extremity) should be one of the factors for falls that is assessed and treated in older adults at risk for falls.

Kristine E. Ensrud (2013) conducted a prospective study to assess the Frailty and Risk of Falls, Fracture, and Mortality in elderly. Study included 100 elderly ≥ 69 years and followed them prospectively for incident falls, fractures, and mortality.

Incident recurrent falls were Frailty was defined by the presence of three or more of the following criteria. unintentional weight loss, weakness, self-reported poor energy, slow walking speed, and low physical activity. Incident recurrent falls were defined as at least two falls during the subsequent year. Frail elderly were subsequently at increased risk of recurrent falls (multivariate odds ratio = 1.38, 95% confidence interval [CI], 1.02–1.88), hip fracture (multivariate hazards ratio [MHR] = 1.40, 95% CI, 1.03–1.90), any no spine fracture (multivariate hazards ratio MHR = 1.25, 95% CI, 1.05–1.49), and death (multivariate hazards ratio MHR = 1.82, 95% CI, 1.56–2.13). The associations between frailty and these outcomes persisted among elderly ≥ 80 years. In addition, associations between frailty and an increased risk of falls, fracture, and mortality were consistently observed across categories of BMI, including BMI ≥ 30 kg/m^2. Frailty is an independent predictor of adverse health outcomes in older elderly , including very elderly and obese .

Section (B) Studies related to effectiveness of exercise program on Physical performance, Mobility and Falls efficacy among elderly.

Raymond and Arjith Singh (2015) conducted a comparative study to examine the effects of two exercise protocols on the balance of elderly women at New Delhi. Elderly women who participated in a local community project (n = 63) were randomly divided into three groups: the proprioceptive neuromuscular facilitation group (PNFG), Pilates group (PG), and control group (CG). Of the 63 women, 58 completed the program. A training program involving 50-min sessions (strengthening, balance and flexibility) three times a week for 4 weeks. Stabilometric parameters, the Berg Balance Scale score, functional reach test, and timed up and go test (TUG test) were assessed before and 1 month after participation.

In the comparison among groups, the women in the proprioceptive neuromuscular facilitation group(PNFG) showed a significant reduction in most of the stabilometric parameters evaluated and achieved better Berg Balance Scale score, functional reach test result, and TUG test result than did women in the Control group ($p < 0.05$). Women in the Pilates Group showed significantly better performance on the functional reach test and Time Up Go test than did women in the Control Group ($p < 0.05$)**.** Significant differences were observed in balance variables assessed between the proprioceptive neuromuscular facilitation group PNFG and Pilates group compared with control group.

Steadman.J (2014) A randomized controlled trail was conducted to evaluate the effectiveness of balance training programme in improving mobility and wellbeing of elderly people with balance problems. The design used was prospective, single-blind randomized controlled trial and elderly were 199 patients aged 60 years and above, with a Berg Balance Scale score of less than 45. Subjects were given balance training programme for 6 weeks and ten-meter timed walk test and Berg Balance Scale (BBS) were used. BBS showed the following results: intervention – 33.3-42.7, p=0.001, control – 33.4-42.0, P<0.0001. The intervention concluded that exercise programmes are significantly essential to improve the balance and mobility in patients with balance problems.

José A. Serra Rexach (2014) conducted a Randomized Controlled Trial Short-Term, Light- to Moderate-Intensity Exercise (strengthening and balancing exercise) Training Improves Leg Muscle Strength in the Oldest Old. To assess the effects of an 6-week exercise training program with a special focus on light- to moderate-intensity resistance exercises (30 – 70% of one repetition maximum, 1RM)

and a subsequent 4-week training cessation period (detraining) on muscle strength and functional capacity in participants aged 90 and older. Forty elderly were randomly assigned to an intervention and control group (16 women and 4 men per group). six-week muscle strength exercise intervention focused on lower limb strength exercises of light to moderate intensity and experimental group received no interventions . In the intervention group, 1 Repetition Maximum leg press increased significantly with training by 10.6 kg [95% confidence interval (CI)=4.1–17.1 kg; *P*=.01]. Except for the mean group number of falls, which were 1.2 falls fewer per participant in the intervention group (95% CI=0.0–3.0; *P*=.03), no significant training effect on control group was found . So study concluded that Light- to Moderate-Intensity Exercise (strengthening and balancing exercise) improved leg muscle strength.

Barnett A, Smith B, Williams M (2013) A randomized controlled trial was conducted with a purpose to determine whether community-based group exercise improves balance and reduces falls among elderly . The sample comprised of 163 people aged over 65 years who were randomized into either an exercise intervention group or control group. The intervention subjects attended 23 exercise classes over the month. The results revealed that within the 12 week trial period, the rate of falls in the intervention group was 40% lower than that of control group (Odds Ratio – 0.60, 95% Confidence Interval 0.36 – 0.99)). The study concluded that participation in a weekly group exercise programme can improve balance and reduce the rate of falls in at-risk community-dwelling older people.

Campbell , A.J Robertson (2013) A randomized controlled trial was conducted with the aim of assessing the effectiveness of exercise programme of strength and balance retraining exercises in reducing falls and injuries in elderly women.

In the study there were women aged 80 years and above living in the community for a period of 8 weeks. Sample consisted of 116 members in exercise group and 117 members in control group. Results revealed that after 1 year of follow up there were 152 falls in the control group and 88 falls in the exercise group(Odds Ratio-0.65,97% Confidence Interval .39-0.98). The study concluded that an individual programme of strength and balance retraining exercises improved physical function and was effective in reducing falls.

Shumway CA, Gruber W (2013) conducted a study to determine the effect of 2-month exercise program on the prevention of falls in the elderly. Sixty-eight elderly ambulatory volunteers were randomly divided into two groups: the exercise and control groups The exercise training, which consisted of calisthenics, body balance training, muscle power training, and walking ability training 3 days/week. After the 2-month exercise program, the indices of the flexibility, body balance, muscle power, and walking ability significantly improved in the exercise group compared with the control group. The incidence of falls was significantly lower in the exercise group than in the control group (0.0% vs. 12.1%, $P = 0.0363$). The present study showed the beneficial effect of the exercise program aimed at improving flexibility, body balance, muscle power, walking ability and in preventing falls in the elderly.

Ravinder and Lindsey.C (2012) conducted a study to determine the effects of exercise training on Balance improvements among elderly women at Bengaluru. Program included lower-extremity strengthening, walking, and postural control exercises. From a total of 38 respondents, 21 women were randomly assigned to either a treatment group (combined training, n = 12) or a control group (flexibility training, n = 9).

The subjects ranged in age from 62 to 75 years (mean = 68, SD = 3.5). The combined training group exercised three times per week on knee extension and sitting leg press machines, walked briskly for 20 minutes, and performed postural control exercises, which included simple 'tai chi' movements. The flexibility training group performed postural control exercises weekly. Measurements of a 6 weeks of exercise training. The mean displacement of the center of pressure in single stance improved 17% in the combined training group and 7% change in the flexibility training group. A repeated-measures analysis of variance revealed that the difference in improvement between the combined training and flexibility training groups was significant at $p(< 0.05)$ level.

Lukinen H, Lehtola (2012) Conducted a population-based, randomized, controlled trial conducted on balance and strengthening exercise-oriented prevention of falls among the elderly. The study was conducted among 100 home-dwelling persons aged 85 years. Altogether 88 subjects (88%) had a history of recurrent falls or at least one risk factor for disability in the activities of daily living or mobility and were randomly assigned to receive suggestions for a program consisting of home exercise, walking exercise, group activities or self-care exercise or alternatively routine care for period of 3 months. Falls were monitored for a median of 3 months during the intervention. The time of first four falls and all falls did not significantly differ in the targeted intervention group (N=50); compared to controls (N=50), hazard ratio 0.88 (95% Confidence Interval 0.74 to 1.04) and 0.93 (0.80-1.09), respectively. Among those able to move outdoors, the corresponding hazard ratios in the intervention group (N=40) compared to the controls (N=50) were 0.78 (0.64-0.94) and 0.88 (0.74-1.05).

After the intervention period, impaired balance was less common in the intervention than in the control subjects; 64 (45%) and 89 (59%) ($p<0.05$ df-4 19.43). The result showed strengthening and balancing exercise intervention was effective in reducing the falling risk in experimental group than in control group.

Vivian Weerdesteyn (2011) conducted a test to whether Nijmegen Falls Prevention Program was effective in reducing falls and improving standing balance, balance confidence, and obstacle avoidance performance in community-dwelling elderly people. A total of 113 elderly with a history of falls participated in this study (exercise group, n = 79; control group, n = 28; dropouts before randomization, n = 6). Exercise sessions were held twice weekly for 5 weeks. Pre- and post-intervention fall monitoring and quantitative motor control assessments were per- formed. The outcome measures were the number of falls, standing balance, obstacle avoidance performance and balance confidence scores. The number of falls in the exercise group decreased by 46% (incidence rate ratio (IRR) 0.54, 95% confidence interval (CI) 0.36–0.79) compared to the number of falls during the baseline period and by 46% (Incidence Rate Ratio 0.54, 95% Confidence Interval 0.34– 0.86) compared to the control group. Obstacle avoidance success rates improved significantly more in the exercise group (on average 12%) compared to the control group (on average 6%). The exercise group also had a 6% increase of balance confidence scores. The Nijmegen Falls Prevention Program was effective in reducing the incidence of falls in otherwise healthy elderly.

Ambrose LT, Khan KM (2011) conducted a study to determine the effect of 2-month exercise program on the prevention of falls in the elderly. Sixty-eight elderly ambulatory volunteers were randomly divided into two groups: the exercise and control groups.

The daily exercise, which consisted of calisthenics, body balance training (tandem standing, tandem gait, and unipedal standing), muscle power training (chair-rising training), and walking ability training (stepping), were performed 3 days/week only in the exercise group. No exercise was performed in the control group. Exercise program improved the indices of the flexibility, body balance, muscle power, and walking ability and reduced the incidence of falls compared with non-exercise controls. The incidence of falls was significantly lower in the exercise group than in the control group (0.0% vs. 12.1%, $P = 0.0363$). The exercise program was safe and well tolerated in the elderly.

Daniel Fedrick (2011) conducted a study to assess the Effective Exercise for the prevention of falls in community. Randomized controlled trials that compared fall rates in older people who undertook exercise programs with fall rates in those who did not exercise were included. The pooled estimate of the effect of exercise was that it reduced the rate of falling by 17% (44 trials with 9,603 participants, rate ratio (RR)=0.83, 95% confidence interval (CI)=0.75–0.91, $P<.001$, $I^2=62\%$). The greatest relative effects of exercise on fall rates (RR=0.58, 95% Confidence Interval=0.48–0.69, 68% of between-study variability explained) were seen in programs that included a combination of a higher total dose of exercise (>50 hours over the trial period) and challenging balance exercises (exercises conducted while standing in which people aimed to stand with their feet closer together or on one leg, minimize use of their hands to assist, and practice controlled movements of the center of mass) and did not include a walking program.

R.A. Faulkner (2011) conducted a experimental study to assess the Relationship between Falls Efficacy and Improvement in Fall Risk Factors in older adults**.** Fifty-four older adults with atleast one risk factor for falls received balance and strengthening exercise twice weekly plus education once weekly (EE) or balance and strengthening exercise only, twice weekly (EO), for 8 weeks. Education participants with low baseline falls efficacy demonstrated significantly (p<0.05 df=3 18.45) greater improvement in balance and falls efficacy compared to Experimental participants with high baseline falls efficacy. Individuals with one or more fall-risk factors and low falls efficacy may benefit from receiving an intervention that combines exercise with self-efficacy-enhancing education. Falls-efficacy screening may be important for decisions regarding referral to fall-prevention programmes.

Douglas P. Burrows (**2010)** conducted a randomized controlled trials study to determine the effects of exercise on falls prevention in elderly and establish whether particular trial characteristics or components of exercise programs are associated with larger reductions in falls in elderly. The study participants were 100 from the nursing homes. Systematic review with meta-analysis compared fall rates in elderly who undertook exercise programs with fall rates in those who did not exercise were included. The pooled estimate of the effect of exercise was that it reduced the rate of falling by 17% (44 trials with 9,603 participants, rate ratio (RR)=0.83, 95% confidence interval (CI)=0.75–0.91, P<.001, I^2=62%). The greatest relative effects of exercise on fall rates (Rate Ratio=0.58, 95% Confidence Interval=0.48–0.69, 68% of between-study variability explained) were seen in programs that included a combination of a higher total dose of exercise (>50 hours over the trial period) and challenging balance exercises (exercises conducted while standing in which people

aimed to stand with their feet closer together or on one leg, minimize use of their hands to assist, and practice controlled movements of the center of mass) and did not include a walking program. Exercise can prevent falls in older people. Greater relative effects are seen in programs that include exercises that challenge balance, use a higher dose of exercise, and do not include a walking program. Service providers can use these findings to design and implement exercise programs for falls prevention.

Rosendahl E, Gustafson Y(2010) A study was conducted on the effectiveness of a high-intensity functional exercise program in reducing falls in residential care facilities. Participants comprised 191 older people, 139 women and 52 men, who were dependent in activities of daily living. Participants were randomized to a high-intensity functional exercise program or a control activity, consisting of 29 sessions over 3 months. The fall rate and proportion of participants sustaining a fall were measured and analyzed using negative binominal analysis and logistic regression analysis, respectively. The exercise group had a lower fall rate than the control group (exercise 2.7% falls per year, control 5.9% falls per year), incidence rate ratio (95% CI) 0.44 (0.21-0.91), p=0.03. The study showed that older people living in residential care facilities, a high-intensity functional exercise program may prevent falls among those who improve their balance.

CHAPTER-III

METHODOLOGY

RESEARCH METHODOLOGY:

Methodology refers to the techniques used to structure a study to gather and analyze information in a systematic fashion. – **Polit & Hungler, 2003.**

RESEARCH APPROACH:

The research approach used for this study was quantitative approach.

RESEARCH DESIGN:

Pre Experimental research design, one group pretest - post test design.

O_1 X O_2

O_1	-	Pretest to assess the levels of physical performance, mobility and falls efficacy.
X	-	Tailored exercise program
O_2	-	Post test to assess the levels of physical performance, mobility and falls efficacy

SETTING OF THE STUDY:

The study was conducted in a selected old age home Arcot ,Vellore located which was located within 30 kms away from Sri Narayani College of Nursing .

POPULATION:

The population selected for the study was the elderly admitted in Mahatma Gandhi Old Age Home Arcot, Vellore.

SAMPLE:

The sample selected for this study was elderly of 60 yrs and above residing in Mahatma Gandhi Old Age Home.

SAMPLING TECHNIQUE:

Purposive sampling technique was used to select the elderly for the study.

SAMPLE SIZE:-

The study included 30 elderly who meet the inclusion criteria.

CRITERIA FOR THE STUDY:-

INCLUSIVE CRITERIA: Elderly who are

- Aged 60 and above.
- Available during the period of data collection..
- Willing to participate.
- Able to verbalize their concern in preventing falls .
- Scoring more than 10/20 in mobility scale and more than 17/36 in physical performance scale.

EXCLUSIVE CRITERIA: Elderly who

- Have neurological disorders.
- Have visual problems
- Have hearing deficits.
- Have gait and movement disorders.
- Use assistive devices for activities of daily living.
- Had undergone surgeries such as orthopedic, abdominal surgeries.
- Had fractures within the last 5 years.

VARIABLES:-

Independent Variables: Tailored Exercise program which includes flexibility, balance and strengthening exercises.

Dependent Variables : Levels of physical performance, mobility and falls efficacy.

Demographic Variables : Age, gender, BMI, educational status, history of co-morbid illness, current treatment of illness with medication , history of previous falls, falls frequency, period of fall and treatment taken for previous fall.

DATA COLLECTION METHOD AND TOOL:

Selection of the tool:

Tool is an instrument used by the researcher to collect the data. The instrument selected in a research should be as far as possible be vehicle that would be best obtaining data for drawing conclusions, which are pertinent to data.

Standardized tools will be used to assess the physical performance, mobility and falls efficacy before and after intervention.

Based on the objectives of the study, demographic profile, standardized tools was used to assess the physical performance, mobility and falls efficacy.

The tool was divided into two sections : Section A and Section B.

Section A: Demographic profile

This section consists of 10 items pertinent to elderly participant such as age, gender, BMI, educational status, history of co-morbid illness, current treatment for co-morbid illness , history of previous falls, if yes frequency, period of fall and treatment taken for previous falls.

Section B: Structured questionnaire to assess the physical performance, mobility and falls efficacy of the elderly which had 3 scales namely Physical performance scale, Elderly mobility scale and Falls efficacy scale.

Physical Performance Test consists of 9 items such as standing static balance, chair raise, lift a book and put it on a shelf , pick up a penny from floor, put on and remove a jacket, turn 360 degrees, 50- foot walk test, climb one flight of stairs , climb stairs and the total score is 36 which indicates not frail; whereas scores between 25-36 indicates mildly frail ; scores between 17-36 indicates moderately frail and below scores below 17 indicates unlikely to function in the community.

Elderly Mobility Scale consists of 7 items such as lying to sitting, sitting to lying, sitting to standing, standing, gait, timed walk (6 meters) which has a total score of 20. The score 14-20 indicates independent in Activity of Daily Living; score of 10-13 indicates borderline in safe mobility and independence in Activity of Daily Living, below 10 indicates dependent maneuvers and requiring help with basic Activity of Daily Living.

Falls Efficacy Scale consist of 16 items such as cleaning the house, getting dressed or undressed, preparing simple meals, taking bath or shower, going shopping, getting in or out of chair, walking around in neighborhood, reaching for something above the head, answering to a telephone, walking on a slippery surface, visiting a friend or relative, walking in a crowd, walking on a uneven surface, walking up or down a slope, going out to a social event which evaluates about the possibility of falling based on different daily activities done by the elderly, where the score of 16-19 indicates low concern; score of 20-27 indicates moderately concerned and score of 28-64 indicates high concern of the elderly towards falls.

Intervention: The elderly selected for the study was 30 . The selected 30 elderly was divided into two groups A and B. Group had 15 elderly each , in which group A had interventions on Monday, Wednesday , Friday and group B had intervention on Tuesday, Thursday and Saturday. The intervention was demonstrated by the researcher and it was redemonstrated by the elderly under researcher's supervision . Intervention was given three times a week for a period of 5 weeks. Post test was conducted by the researcher after 5 weeks of tailored exercise program.

Tailored exercise program: It includes flexibility, strengthening and balancing exercises adopted for the purpose of study performed for 30 minutes (3 days in a week) for a period of 5 weeks demonstrated by the researcher.

Flexibility exercise: It refers to the neck rotating, neck stretching, sideways bending of hip, calf stretching exercise which are done for 8 minutes (two minutes for each exercise with 6 times each minute).

Strengthening exercise: It refers to sitting to standing, mini squatting, calf raising, sideways leg lifting, wall pressing by hand, leg extension exercise which are done for 12 minutes. (two minutes for each exercise with 6 times each minute).

Balancing exercise : It refers to sideways walking, simple grapevine, heel to toe walking, one leg standing, stepping up exercise which are don for 10 minutes (two minutes for each exercise with 6 times each minute).

VALIDITY

Validity is the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure **(Polit & Beck 2013).**

The content validity of the tool was obtained from several experts in the field of Medical and Surgical Nursing, statistics. Initially section A had 7 demographic variables. Experts gave opinion to include frequency of previous falls, period of previous falls, treatment taken for previous falls, and demographic variables were increased to 10 items.

RELIABILITY :

Reliability is defined as the extent to which the instrument yields the same results on repeated measures, concerned with consistency, accuracy, stability and homogeneity.

- The physical performance scale was administered to 6 elderly, using test and retest method to obtain the reliability of the tool. Since the co-efficient correlation is 0.89, the tool was found to be reliable.

- The elderly mobility scale was administered to 6 elderly using, test and retest method to obtain the reliability of the tool. Since the co-efficient correlation is 0.94, the tool was found to be reliable.

- The falls efficacy scale was administered to 6 elderly, using test and retest method to obtain the reliability of the tool. Since the co-efficient correlation is 1 , the tool was found to be highly reliable.

PILOT STUDY PROCEDURE:

A pilot study is the whole study operation in miniature" it reveals the investigator about the feasibility, weakness, practicability of carrying out the main study. It helps to confirm the duration and to familiarize with administration and scoring of tools.

- (Barnum 2000)

- Duration of pilot study was one week from 1.7.15 to 7.1.15. 6 elderly were selected by using purposive sampling technique.

- Confidentiality was assured among study participants. elderly were divided into two groups A and B. Group has 3 elderly each , in which group A will have interventions on Wednesday , Friday , Monday and group B will have intervention on Thursday, Saturday and Tuesday. Pretest was done on first day using structured interview. Tailored exercise was demonstrated by researcher and it was redemonstrated by the elderly. Tailored exercises were practiced by the elderly under the supervision of the researcher for 3 times in one week.

- One week later Post test was conducted on 7.1.15.

DATA COLLECTION:-

- Ethical clearance from College Research Committee members and written permission from head of institution to conduct the research at Mahatma Gandhi Old age home, Arcot were obtained.

- The main study was conducted from (13.7.15 to 20.8.15). The elderly were informed regarding the research study and informed consent was obtained initially. .

- Tailored exercise was demonstrated by researcher and it was redemonstrated by the elderly under researcher's supervision.

- Elderly had 3 sessions of tailored exercise for 30 minutes per week for a period of 5 weeks under the supervision of the researcher. The 30 elderly were grouped into two groups A and B where group A had interventions on

Monday, Wednesday, Friday and group B had intervention on Tuesday, Thursday and Saturday. After 5 weeks of tailored exercise program, levels of physical performance, mobility and falls efficacy were assessed.

PLAN FOR DATA ANALYSIS:

Descriptive statistics are useful for summarizing empirical information.

The collected data will be analyzed using descriptive and inferential statistics using the following steps:

- Frequency and percentage of data will be calculated to describe demographic variables with Mean and Standard Deviation.
- Effectiveness of Tailored exercise program on levels of physical performance, mobility and falls efficacy will be analyzed using Paired‘t’ test.
- Associating the post test levels of physical performance, mobility and falls efficacy and the selected demographic variables will be analysed using 'Chi'-square test.

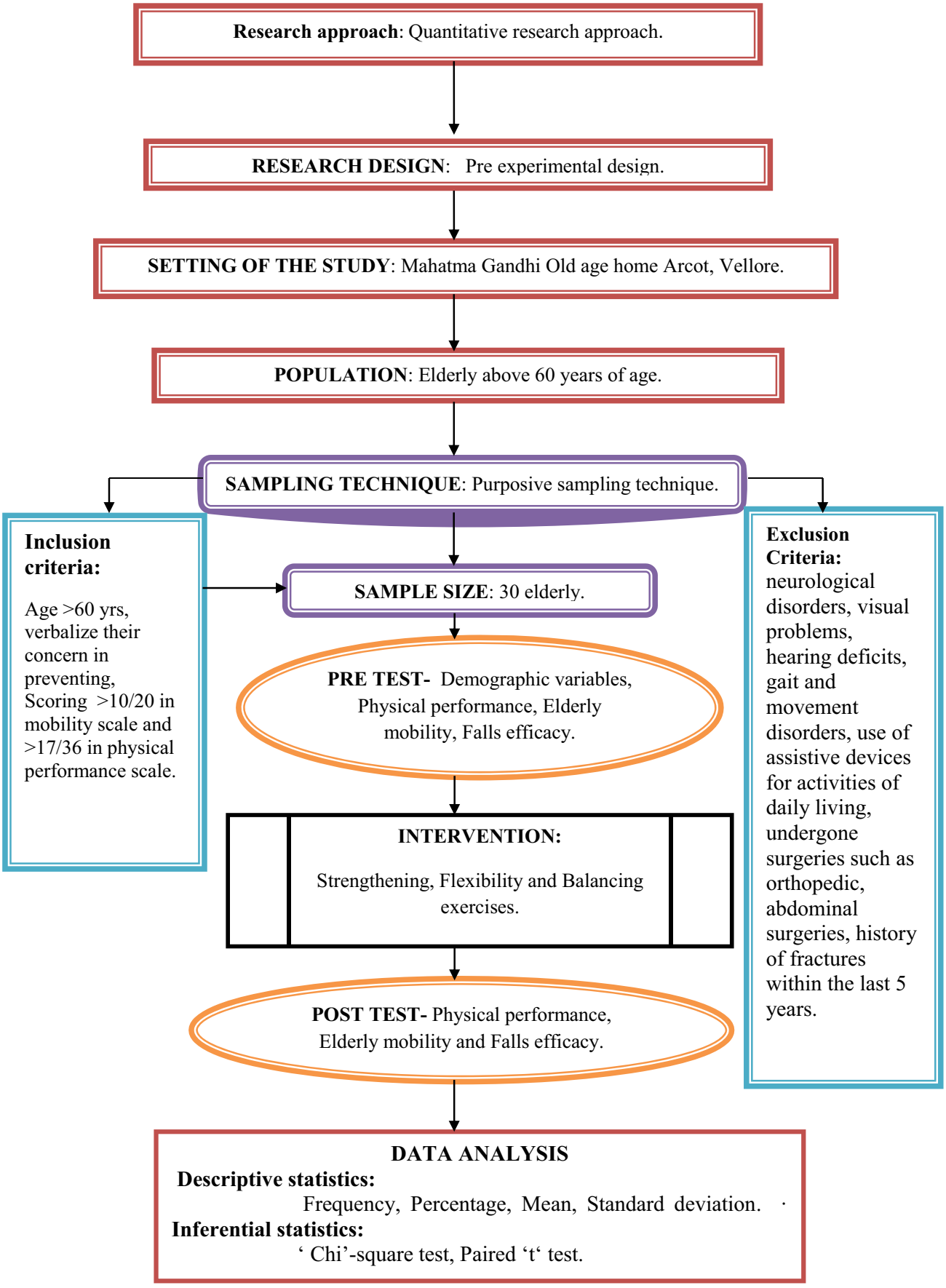


FIGURE 2: SCHEMATIC PRESENTATION OF METHODOLOGY.

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

Data was obtained on effectiveness of tailored exercises on Physical performance, Mobility and Falls efficacy among Elderly in a selected old age home, Vellore.

The demographic variables and scores of physical performance, mobility and falls efficacy were coded and analyzed. Analysis and interpretation was done with the help of descriptive and inferential statistics to meet the objectives of the study. The data thus collected was analyzed and interpreted.

This chapter includes three sections. The results and analysis are presented in the following order.

ORGANIZATION OF DATA

Section A: Distribution of demographic variables of elderly residing in a selected old age home, Vellore.

Section B : Frequency and percentage distribution of levels of physical performance, mobility and falls efficacy among elderly in a selected old age home, Vellore.

Section C : Effectiveness of Tailored exercise among Elderly on Physical performance, mobility and Falls efficacy.

Section D: Association between the Post test scores of Physical performance, mobility and falls efficacy and the selected Demographic variables among elderly.

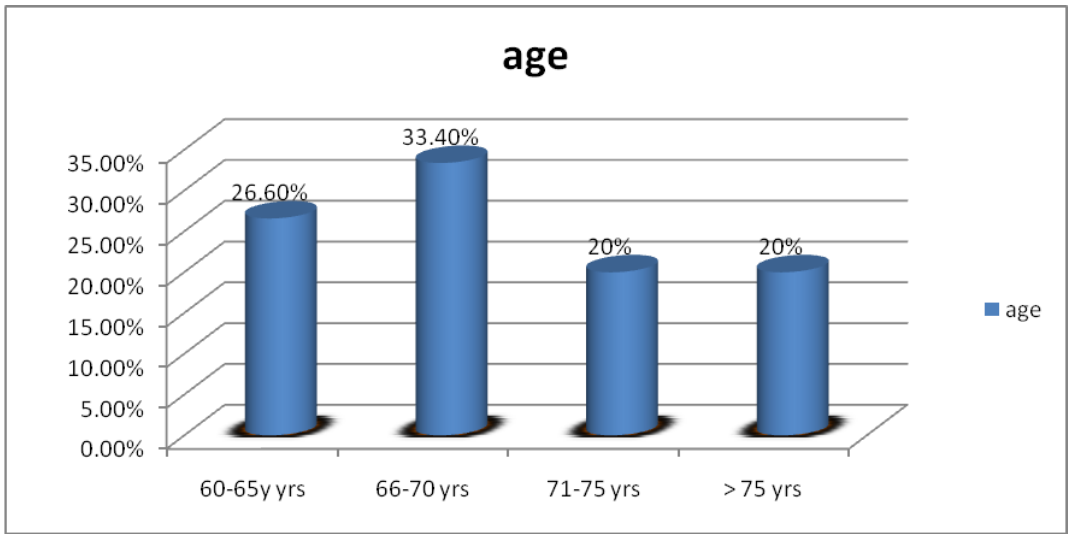
Section A: DISTRIBUTION OF DEMOGRAPHIC VARIABLES OF ELDERLY RESIDING IN A SELECTED OLD AGE HOME, VELLORE.

Table 1: Frequency and percentage distribution of elderly according to age.

n = 30

Age	No.	Percentage (%)
60-65 yrs	8	26.6
66-70 yrs	10	33.4
71-75 yrs	6	20
Above 75 yrs	6	20

Figure 3 showing percentage distribution of elderly according to age.



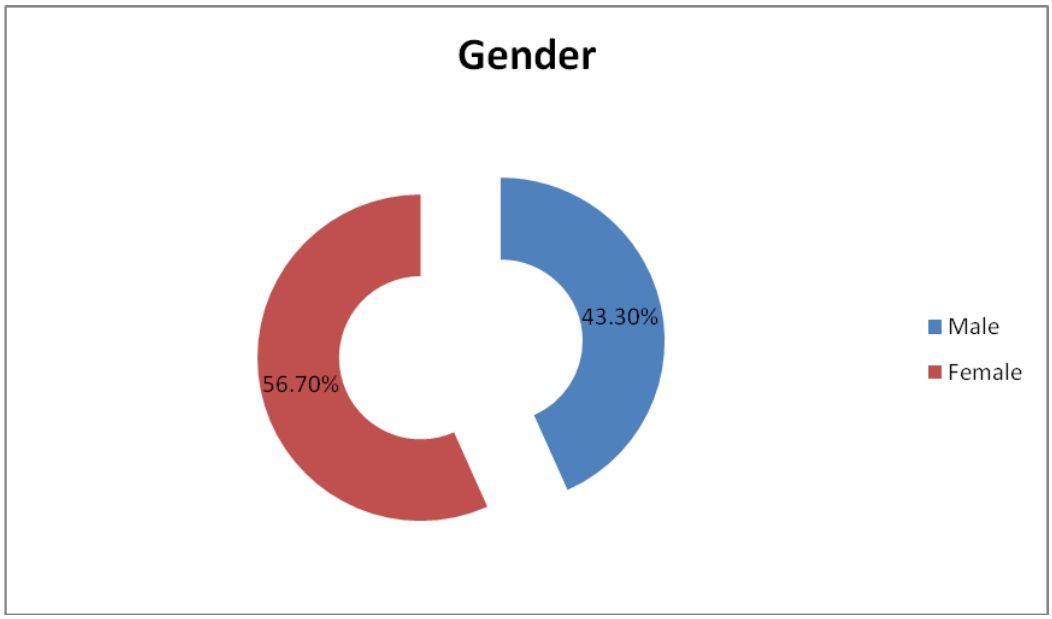
The data presented in the above table 1 and figure 3 depicts that 10 (33.4%) of elderly are in the age between 66-70, 8 (26.6%) are in the age between 60-65 years 6 (20%) are in the age between 71-75 years, 6(20%) are above 75 years of age, in the old age home.

Table 2: Frequency and percentage distribution of elderly according to gender.

n=30

Sex	No.	Percentage (%)
Male	13	43.3
Female	17	56.7

Figure 4 : Doughnut chart showing percentage distribution of elderly according to gender.

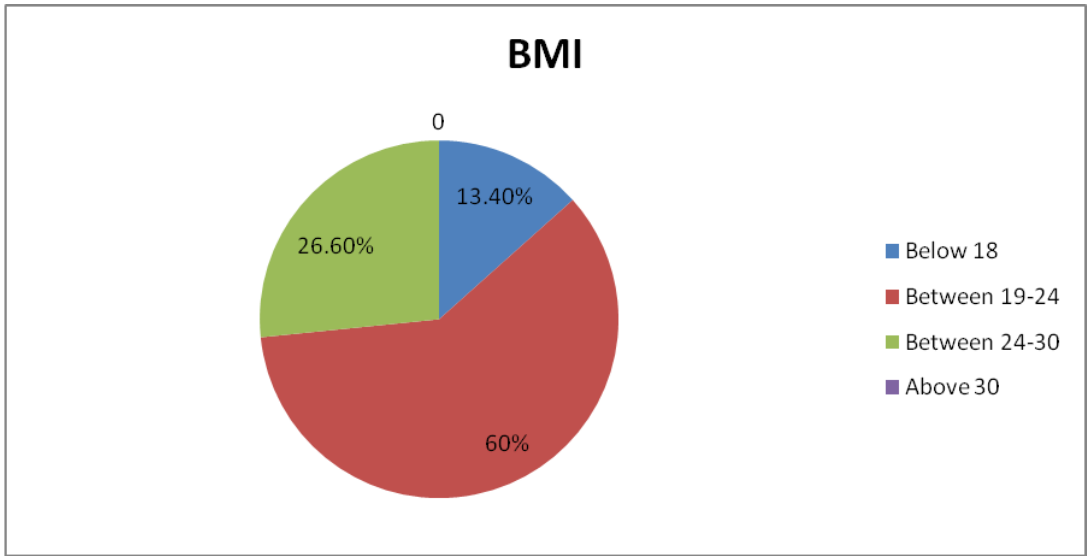


The data presented in the above table 2 and figure 4 reveals that majority of the elderly were Females 17 (56.7%) and 13(43.3%) were males.

Table 3: Frequency and percentage distribution of elderly according to Body Mass Index (BMI) **n=30**

BMI	No.	Percentage (%)
Below 18	4	13.4
Between 19-24	18	60
Between 24-30	8	26.6
Above 30	-	-

Figure 5 showing percentage distribution of elderly according to Body Mass Index (BMI)

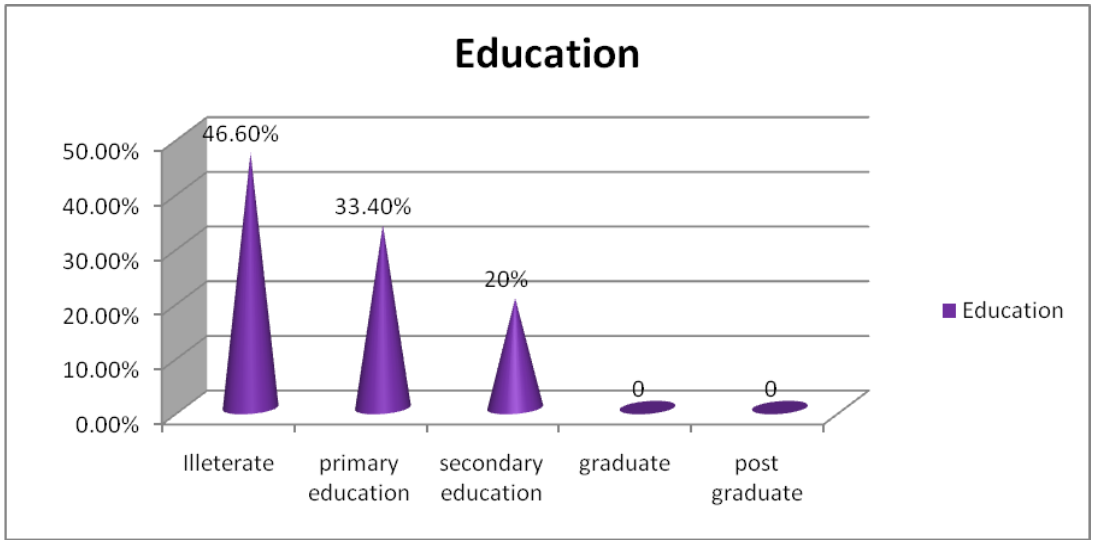


The above table 3 and figure 5 depicts that majority of the elderly 18(60%) are between 19- 24 (normal) BMI, 8 (26.6%) are between 24-30 (over weight) BMI and 4 (13.4%) are below 18 BMI (under nourished) according to WHO classification.

Table 4: Frequency and percentage distribution of elderly according to education. n=30

Education	No.	Percentage (%)
Illiterate	14	46.6
Primary education	10	33.4
Secondary education	6	20
Graduate	-	-
Post graduate	-	-

Figure 6: Cone graph showing percentage distribution of elderly according to educational status.



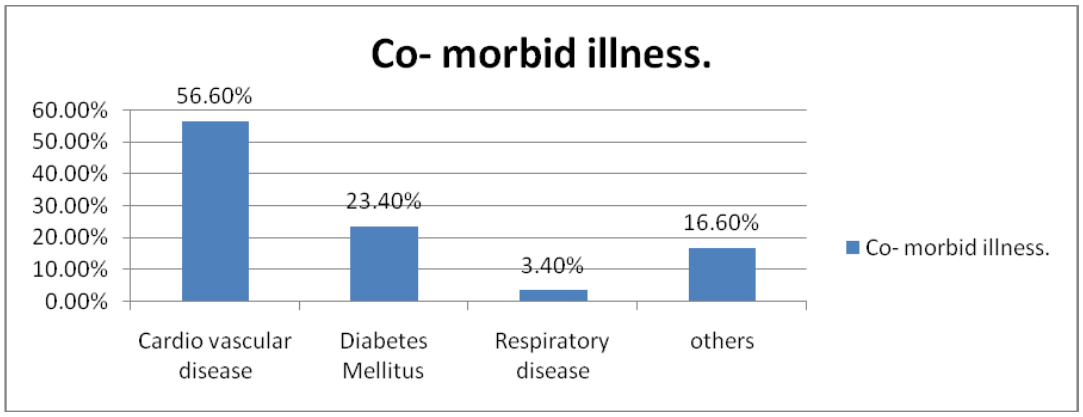
The above table 4 and figure 6 shows that most of the elderly 14 (46.6%) are illiterate, 10 (33.4%) had studied upto primary education , 6 (20%) had studied upto secondary education and none of the elderly had graduate and post graduate education.

Table 5: Frequency and percentage distribution of elderly according to Co- morbid illness.

n=30

if yes	No.	Percentage(%)
Cardio vascular disease	17	56.6
Diabetes Mellitus	7	23.4
Respiratory disease	1	3.4
Others	5	16.6

Figure 7 : Column graph showing percentage distribution of elderly according to Co- morbid illness .



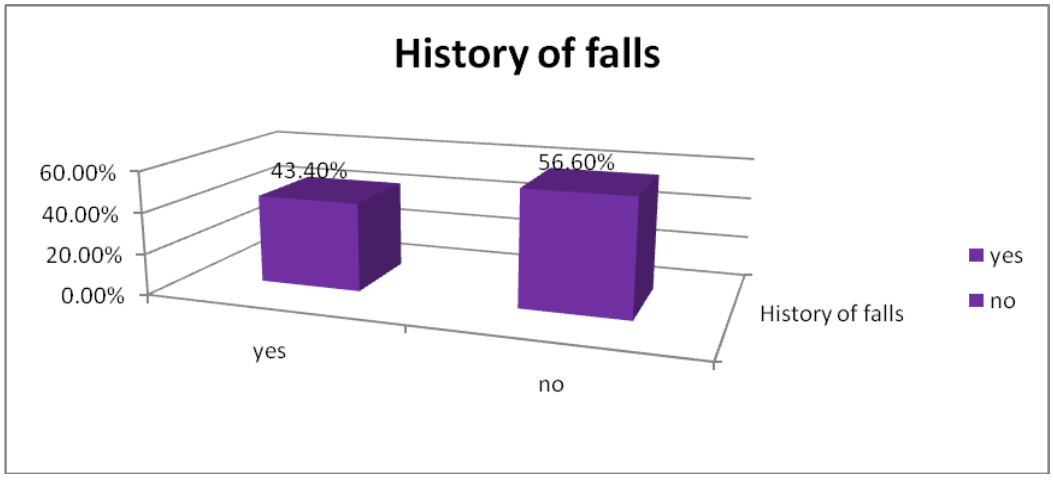
The above table 5 and figure 7 shows that all the elderly have co-morbid illness. Majority of the elderly 17 (56.6%) have cardio vascular disease, 7 (23.4%) have Diabetes mellitus, 5 (16.6%) have other types of disease like gastritis (4), renal calculi (1) and 1 (3.4%) have asthma. All the elderly are on regular medical treatment.

Table 6: Frequency and percentage distribution of elderly according to previous history of falls.

n=30

History of falls.	No.	Percentage (%)
Yes	13	43.4%
No	17	56.6%

Figure 8 : Column graph showing percentage distribution of elderly according to previous history of falls.

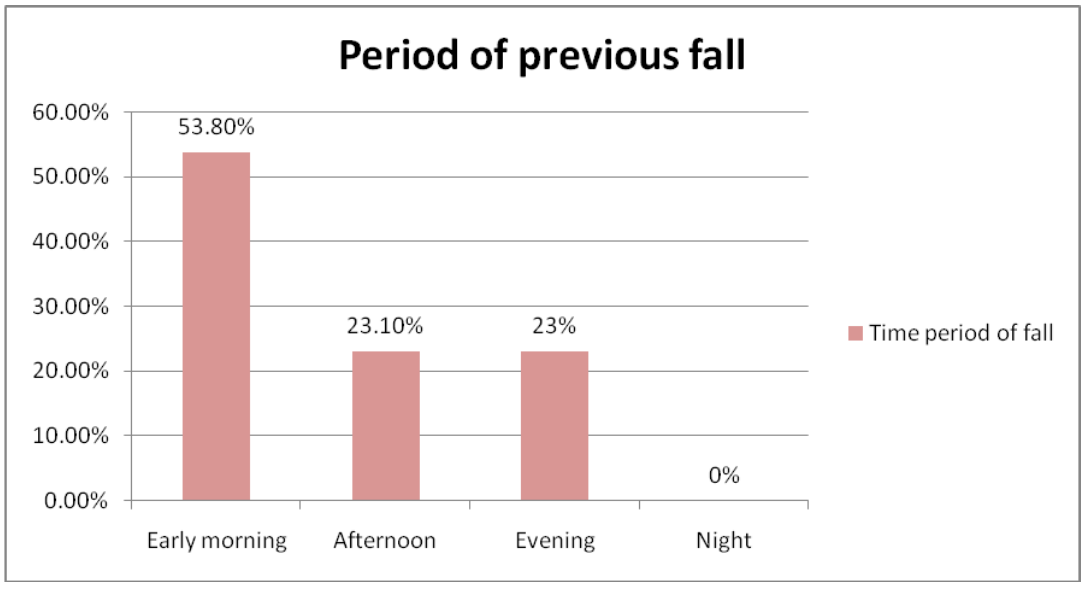


The above table 6 and figure 8 represents largely 17(56.6%) of the elderly does not have history of falls and 13 (43.4%) have history of falls with frequency less than 5 times, in the last five years.

Table 7 : Frequency and percentage distribution of elderly according to period of fall . n= 13

Period of Fall.	No.	Percentage (%)
Early morning	7	53.8
Afternoon	3	23.1
Evening	3	23.1
Night	-	-

Figure 9: Column graph showing percentage distribution of elderly according to period of previous fall.

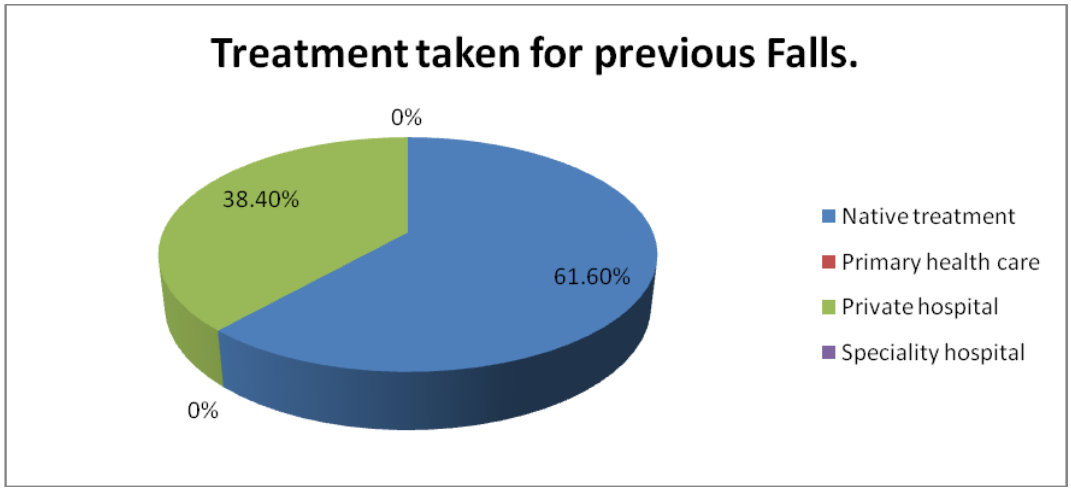


The above mentioned table 7 and figure 9 shows that majority of the elderly 7 (53.8%) fall during early morning, 3 (23.1%) fall during afternoon, 3 (23.1%) fall during evening and none of the elderly had falls during night.

Table 8 : Frequency and percentage distribution of type of elderly according to treatment taken for previous falls. n=13

Type of Treatment taken for Fall.	No.	Percentage(%)
Native treatment	8	61.6%
Primary health care	-	-
Private hospital	5	38.4%
Specialty hospital	-	-

Figure 10 : Pie chart showing percentage distribution of elderly according to treatment taken for previous falls.



The above table 8 and figure 10 shows that more than half of the elderly 8 (61.6%) have taken Native treatment and 5% (38.4%) have taken treatment in private hospitals and none of the elderly have preferred treatment in primary health centre or specialty hospital for previous falls.

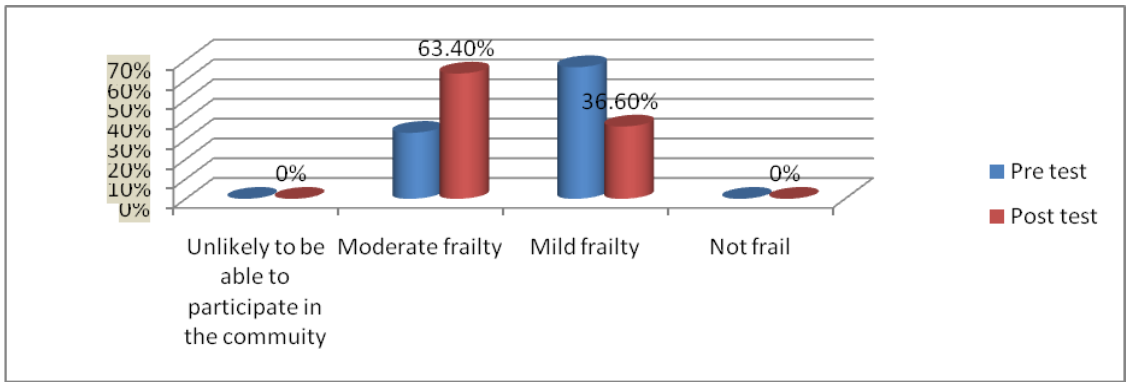
SECTION B : (a) LEVELS OF PHYSICAL PERFORMANCE AMONG ELDERLY IN A SELECTED OLD AGE HOME, VELLORE.

Table 9: Percentage and frequency distribution on levels of physical performance.

n = 30

Levels of physical performance	Pre - test		Post- test	
	frequency	percentage %	frequency	percentage %
Unlikely to be able to participate in the community. [less than 17 Score]	-	-	-	-
Moderate frailty [17-24 Score]	10	33.4 %	19	63.4%
Mild frailty [25-31 Score]	20	66.6 %	11	36.6%
Not frail (32-36 score)	-	-	-	-

Figure 11: Column chart showing Percentage distribution of levels of physical performance among elderly.



The Table No.9 and figure 11 depicts that in pre test 20 (66.6%) of elderly had 'moderate frailty', 10 (33.4%) scored as 'mild frailty' and none of them scored in the group 'not frail' and 'unlikely to participate in the community' in the group. In post test 11 (36.6%) of elderly were found to be 'moderately frail', 19 (63.4%) were 'mildly frail' and none of the elderly were 'not frail' and 'unlikely to participate in the community' after tailored exercise program.

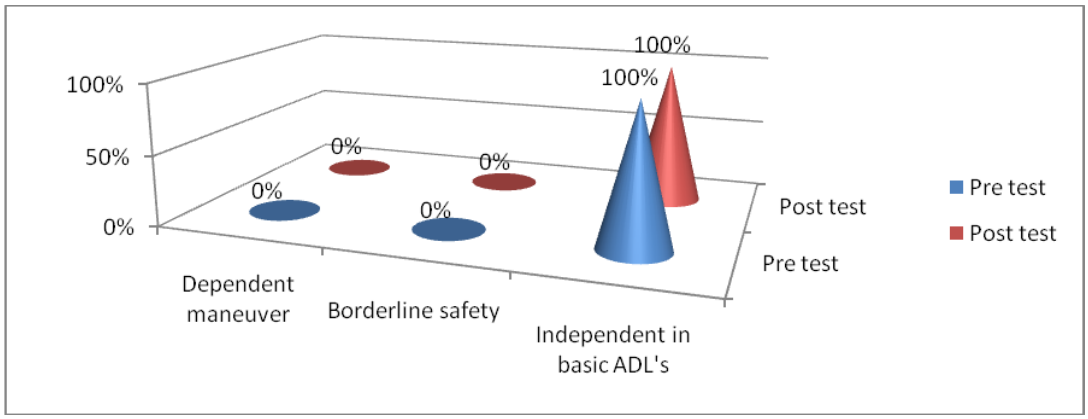
SECTION B : (b) LEVELS OF MOBILITY AMONG ELDERLY IN A SELECTED OLD AGE HOME, VELLORE.

Table 10: Percentage and frequency distribution on levels of elderly mobility.

n = 30

Levels of elderly mobility	Pre - test		Post- test	
	frequency	percentage %	frequency	percentage %
Dependent maneuver. [less than 10 Score]	-	-	-	-
Borderline safety [10 -13 Score]	-	-	-	-
Independent in basic Activity of Daily Living (ADL's) [14-16 Score]	30	100 %	30	100%

Figure 12: Cone graph showing percentage distribution of levels of mobility among elderly.



The Table No. 10 and figure 12 depicts that in pre test 30 (100%) of elderly were 'independent in Activity of Daily Living' (ADL's) and none of elderly were in the group of 'dependent maneuver' and 'borderline safety'. In post test 30 (100%) of elderly were 'independent in Activity of Daily Living' (ADL's) and none of elderly were under 'dependent maneuver' and 'borderline safety' after tailored exercise program.

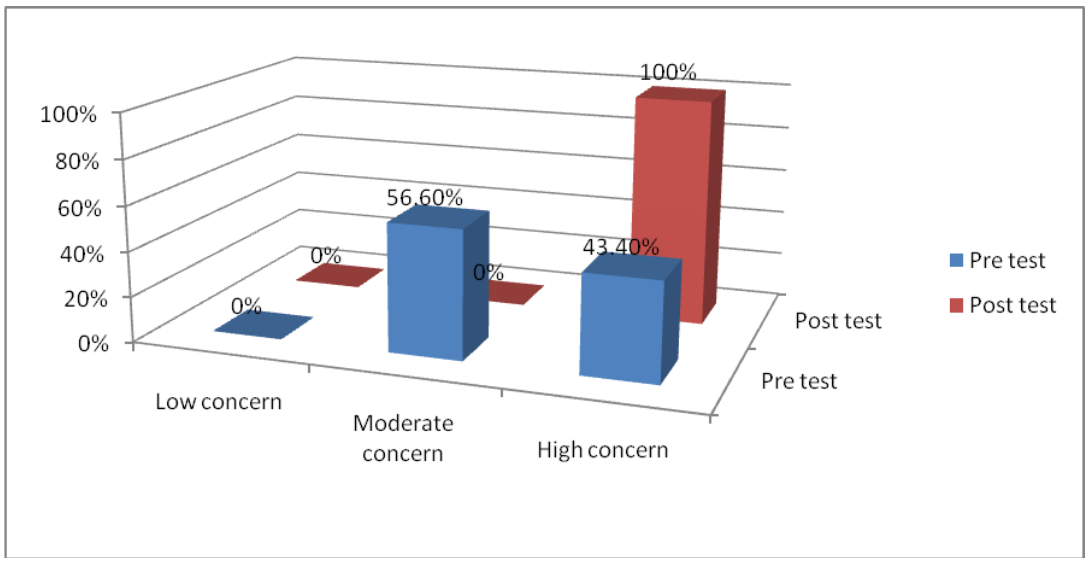
SECTION B : (c) LEVELS OF FALLS EFFICACY AMONG ELDERLY IN A SELECTED OLD AGE HOME, VELLORE.

Table 11: Percentage and frequency distribution on levels of falls efficacy.

n = 30

Levels of falls efficacy	Pre - test		Post- test	
	frequency	percentage %	frequency	percentage %
Low concern. [16-19 Score]	-	-	-	-
Moderate concern [20-27 Score]	17	56.6%	-	-
High concern [28-64 Score]	13	43.4%	30	100%

Figure 13: Column graph showing percentage distribution of levels of falls efficacy among elderly.



The Table No.11 and figure 13 depicts that in pre test 17 (56%) of elderly had moderate concern, 13 (43.4) had high concern and none of the elderly had low concern regarding falls. In the post test, 30 (100%) of elderly had high concern and none of the elderly had low or moderate concern after tailored exercise program.

SECTION C: (a) EFFECTIVENESS OF TAILORED EXERCISE PROGRAM ON PHYSICAL PERFORMANCE.

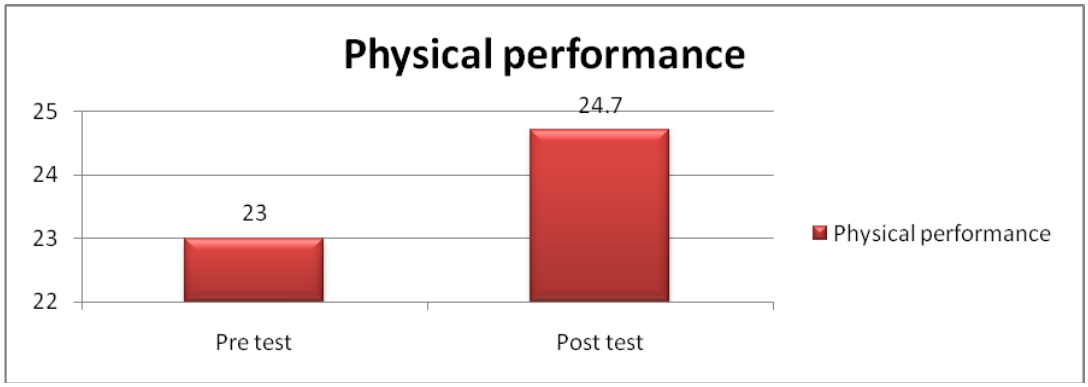
Table 12: Effectiveness of Tailored Exercise program on physical performance.

n = 30

Physical performance	Mean	Standard Deviation	Mean difference	Paired 't' test
Pre test	23	3.60	1.7	3.3*
Post test	24.7	2.44		

Note * statistically significant (p<0.01)

Figure 14: Column graph showing Pre test and Post test scores of Physical Performance among elderly.



The above table 12 and figure 14 shows that pre test mean value is 23. After tailored exercise program the post test mean value is 24.7. The calculated 't'value (3.3) is greater than that of the table value (2.76). This shows that Tailored exercise program is effective in improving Physical performance among elderly, significant at p (<0.01) level. Hence, it is interpreted that the difference in mean score was true difference and not by chance and the hypothesis H_1 was accepted.

SECTION C: (b) EFFECTIVENESS OF TAILORED EXERCISE PROGRAM ON ELDERLY MOBILITY.

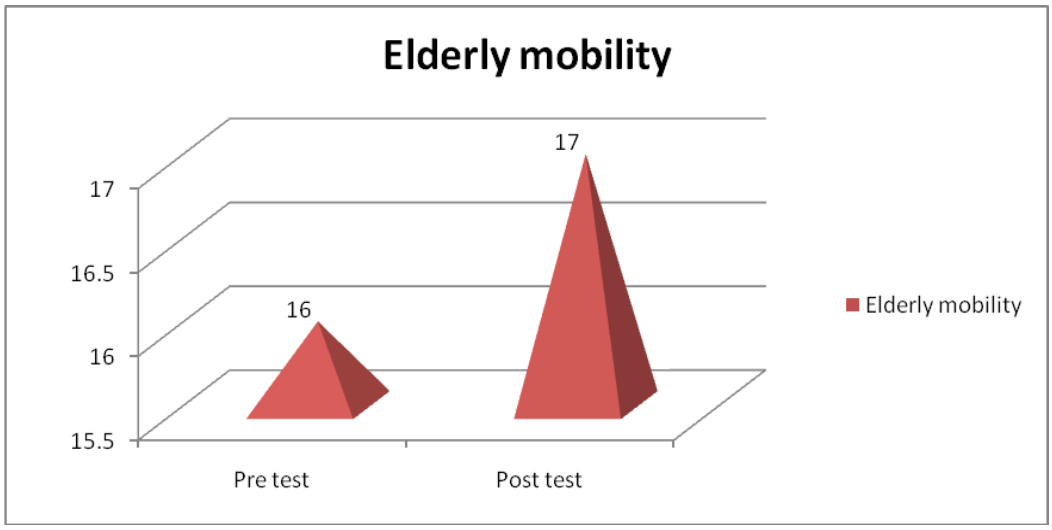
Table 13: Effectiveness of Tailored Exercise program on Elderly Mobility.

n = 30

Elderly Mobility.	Mean	Standard Deviation	Mean difference	Paired 't' test
Pre test	16	1.15	1	**5.3***
Post test	17	1.42		

Note *statistically significant (p<0.01)

Figure 15: Cone graph showing Pre test and Post test scores on Elderly Mobility.



The above table 13 and figure 15 shows that pre test mean value is 16. After tailored exercise program the post test mean value is 17. The calculated 't'value (5.3) is greater than that of the table value (3.66). This shows that Tailored exercise program is effective in improving Elderly Mobility among elderly, significant at p (<0.01) level. Hence, it is interpreted that the difference in mean score was true difference and not by chance and the hypothesis H_2 was accepted.

SECTION C: (c) EFFECTIVENESS OF TAILORED EXERCISE PROGRAM ON FALLS EFFICACY.

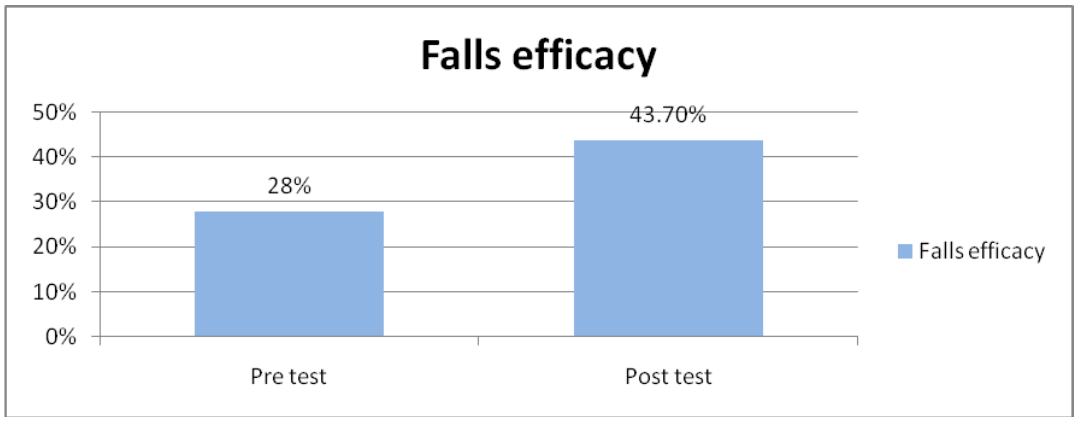
Table 14: Effectiveness of Tailored Exercise program on Falls efficacy.

n= 30

S.No.	Falls efficacy	Mean	Standard Deviation	Mean difference	Paired 't' test
1.	Pre test	28	5.62	15.7	**12.7***
2.	Post test	43.7	4.17		

Note *statistically significant (p<0.001)

Figure 16: Pie chart showing Pre test and Post test scores on Falls Efficacy among elderly.



The above table 14 and figure 16 shows that the pre test mean value is 28. After tailored exercise program post test mean value is 43.7. The calculated 't' value (12.7) is greater than that of the table value (3.66). This shows that the tailored exercise program is effective in improving falls efficacy among elderly, significant at p (<0.001) level. Hence, it is interpreted that the difference in mean score was true difference and not by chance and the hypothesis H_3 was accepted.

SECTION D: (a) ASSOCIATION BETWEEN POST TEST SCORES OF PHYSICAL PERFORMANCE AND THE SELECTED DEMOGRAPHIC VARIABLE AMONG ELDERLY.

Table 15: Association between post test scores of physical performance and the selected demographic variable among elderly. n =30

Demographic Variables	Sample (n)		Physical performance								Chi Square x^2 Value P<0.05
	No	%	32-36		25-31		17-24		<17		
			No	%	No	%	No	%	No	%	
Age											
60-65 yrs	8	26.6	-	-	5	62.5	3	37.5	-	-	2.028 Df=9 **NS**
66 - 70 yrs	10	33.4	-	-	5	50.0	5	50.0	-	-	
71-75 yrs	6	20.0	-	-	3	50.0	3	50.0	-	-	
Above 75	6	20.0	-	-	5	83.4	1	16.6	-	-	
Sex											
Male	13	43.3	-	-	9	69.2	4	30.8	-	-	0.335 Df=3 **NS**
Female	17	56.7	-	-	10	58.8	7	41.2	-	-	
BMI											
Below 18	4	13.4	-	-	3	75.0	1	25.0	-	-	2.76 Df=3 **NS**
Between 19-24	18	60.0	-	-	10	55.5	8	44.6	-	-	
Between 24-30	8	26.6	-	-	6	75.0	2	25.0	-	-	
Above 30	-	-	-	-	-	-	-	-	-	-	

Demographic Variables	Sample (n)		Physical performance								Chi Square x^2 Value P<0.05
	No	%	32-36		25-31		17-24		<17		
			No	%	No	%	No	%	No	%	
Education											
Illiterate	14	46.6	-	-	8	57.2	6	42.8	-	-	3.79 Df=16 **NS**
Primary education	10	33.4	-	-	5	50.0	5	50.0	-	-	
Secondary education	6	20.0	-	-	6	100	-	-	-	-	
Graduate	-	-	-	-	-	-	-	-	-	-	
Post graduate	-	-	-	-	-	-	-	-	-	-	
History of co- morbid illness											
Yes	30	100	-	-	5	16.6	3	10.0	-	-	0 Df=3 **NS**
No	-	-	-	-	5	16.6	5	16.6	-	-	
If yes											
Cardio vascular disease	17	56.6	-	-	8	47.05	9	52.95	-	-	5.652 Df=16 **NS**
Diabetes mellitus	7	23.4	-	-	6	71.4	1	28.6	-	-	
Respiratory disease	1	3.4	-	-	1	100	-	-	-	-	
Others	5	16.6	-	-	4	80.0	1	20.0	-	-	
Current treatment of co-morbid illness.											
Yes	30	100	-	-	19	63.3	11	36.7	-	-	0 Df=3 **NS**
No	-	-	-	-	-	-	-	-	-	-	

Demographic Variables	Sample (n)		Physical performance								Chi Square x^2 Value P<0.05
	No	%	32-36		25-31		17-24		<17		
			No	%	No	%	No	%	No	%	
History of previous falls											
Yes	13	43.4	-	-	8	61.53	5	38.44	-	-	9.045 Df=3
No	17	56.6	-	-	11	58.8	6	5.20	-	-	**S***
If yes, Frequency											
Below 5	13	100	-	-	8	61.5	5	38.6	-	-	0 df=9, **NS**
Below 6 – 10	-	-	-	-	-	-	-	-	-	-	
Between 11-15	-	-	-	-	-	-	-	-	-	-	
Above 15	-	-	-	-	-	-	-	-	-	-	
Period of fall											
Early morning	6	53.8	-	-	4	66.6	3	44.6	-	-	1.025 df=9, **NS**
Afternoon	3	23.1	-	-	1	33.3	2	66.7	-	-	
Evening	4	23.1	-	-	3	75.0	1	25.0	-	-	
Night	-	-	-	-	-	-	-	-	-	-	
Treatment taken for previous fall.											
Native treatment	8	61.6	-	-	6	75	2	25	-	-	0.853 df=9, **NS**
Primary health centre	-	-	-	-	-	-	-	-	-	-	
Private hospital	5	38.4	-	-	3	60	2	40	-	-	
Specialty hospital	-	0	-	-	-	-	-	-	-	-	

Note *statistically significant (p<0.05)

Table 15 Shows association between post test scores of physical performance and the selected demographic variables interpretation:

The 'Chi' square value of the demographic variable history of falls is significant at $p < 0.05$ level. None of the other variables such as age, sex, BMI, education, history of co-morbid illness, current treatment, frequency, period and treatment taken for falls were significant $p < 0.05$ level. Hence, it is interpreted that the difference in mean score was true difference and not by chance and the hypothesis H_4 was accepted.

SECTION D: (b) ASSOCIATION BETWEEN THE ELDERLY MOBILITY AND THE SELECTED DEMOGRAPHIC VARIABLE AMONG ELDERLY.

Table 16: Association between the elderly mobility with the selected demographic variable among elderly.

n= 30

Demographic Variables	Sample (n)		Elderly mobility						Chi Square x^2 Value P<0.05
	No	%	<10		10-13		>14		
			No	%	No	%	No	%	
Age									
60-65 yrs	8	26.6	-	-	-	-	8	26.6	3.86 Df=6 **NS**
66 – 70 yrs	10	33.4	-	-	-	-	10	33.4	
71-75 yrs	6	20.0	-	-	-	-	6	20.0	
above 75	6	20.0	-	-	-	-	6	20.0	
Sex									
Male	13	43.3	-	-	-	-	13	43.3	6.58 Df=4 **S***
Female	17	56.7	-	-	-	-	17	56.7	
BMI									
Below 18	4	13.4	-	-	-	-	4	13.4	2.672 Df=6 **NS**
Between 19-24	18	60	-	-	-	-	18	60.0	
Between 24-30	8	26.6	-	-	-	-	8	26.6	
Above 30	-	-	-	-	-	-	-	-	

Demographic Variables	Sample (n)		Elderly mobility						Chi Square x^2 Value P<0.05
	No	%	<10		10-13		>14		
			No	%	No	%	No	%	
Education									
Illiterate	14	46.6	-	-	-	-	14	46.6	8.04 Df=8 **NS**
Primary education	10	33.4	-	-	-	-	10	33.4	
Secondary education	6	20	-	-	-	-	6	20	
Graduate	-	-	-	-	-	-	-	-	
Post graduate	-	-	-	-	-	-	-	-	
History of Co- morbid illness									
Yes	30	100	-	-	-	-	30	100	0 Df=2 **NS**
No	-	-	-	-	-	-	-	-	
If yes									
Cardio vascular disease	17	56.6	-	-	-	-	17	56.6	4.87 Df=6 **NS**
Diabetes mellitus	7	23.4	-	-	-	-	7	23.4	
Respiratory disease	1	3.4	-	-	-	-	-	-	
Others	5	16.6	-	-	-	-	5	16.6	
Current treatment of co- morbid illness									
Yes	30	100	-	-	-	-	30	100	0 Df=2 **NS**
No	-	-	-	-	-	-	-	-	
History of previous falls									
Yes	13	43.4	-	-	-	-	13	43.4	6.374 Df=2 **S***
No	17	56.6	-	-	-	-	17	56.6	

Demographic Variables	Sample (n)		Elderly mobility						Chi Square x^2 Value P<0.05
	No	%	<10		10-13		>14		
			No	%	No	%	No	%	
If yes, Frequency									
Below 5	13	100	-	-	-	-	13	100	0 Df=6 **NS**
Below 6 – 10	-	-	-	-	-	-	-	-	
Between 11-15	-	-	-	-	-	-	-	-	
Above 15	-	-	-	-	-	-	-	-	
Period of falls									
Early morning	6	53.8	-	-	-	-	6	53.8	13.048 Df=6 S*
Afternoon	3	23.1	-	-	-	-	3	23.1	
Evening	4	23.1	-	-	-	-	4	23.1	
Night	-	-	-	-	-	-	-	-	
Treatment taken for previous falls									
Native treatment	8	61.6	-	-	-	-	8	61.6	2.174 Df=6 **NS**
Primary health centre	-	-	-	-	-	-	-	-	
Private hospital	5	38.4	-	-	-	-	5	38.4	
Specialty hospital	-	-	-	-	-	-	-	-	

Note *statistically significant (p<0.05)

Table 16 Shows association between post test scores of elderly mobility and the selected demographic variables

The 'Chi' square value of the demographic variables such as history of falls and period of falls are significant at $p < 0.05$ level. None of the other variables The demographic variables such as age, sex, history of co- morbid illness, treatment, history of falls, frequency, time period and treatment obtained for falls were not significant at $p < 0.05$ level. Hence, it is interpreted that the difference in mean score was true difference and not by chance and the hypothesis H_5 was accepted.

SECTION D: (c) ASSOCIATION BETWEEN FALLS EFFICACY AND THE SELECTED DEMOGRAPHIC VARIABLE AMONG ELDERLY.

Table 17: Association between falls efficacy and the selected demographic variables among elderly. n= 30

Demographic Variables	Sample (n)		Falls Efficacy						Chi Square x^2 Value P<0.05
	No	%	16-19		20-27		28-64		
			No	%	No	%	No	%	
Age									
60-65 yrs	8	26.6	-	-	-	-	8	26.6	5.011 Df=6 NS
66 - 70 yrs	10	33.4	-	-	-	-	10	33.4	
71-75 yrs	6	20.0	-	-	-	-	6	20.0	
Above 75	6	20	-	-	-	-	6	20	
Sex									
Male	13	43.3	-	-	-	-	13	43.3	2.84 Df=4 NS
Female	17	56.7	-	-	-	-	17	56.7	
BMI									
Below 18	4	13.4	-	-	-	-	4	13.4	13.092 Df=6 S*
Between 19-24	18	60	-	-	-	-	18	60	
Between 24-30	8	26.6	-	-	-	-	8	26.6	
Above 30	-	-	-	-	-	-	-	-	

Demographic Variables	Sample (n)		Falls Efficacy						Chi Square x^2 Value P<0.05
	No	%	16-19		20-27		28-64		
			No	%	No	%	No	%	
Education									
Illiterate	14	46.6	-	-	-	-	14	46.6	15.886 Df=8 S*
Primary education	10	33.4	-	-	-	-	10	33.4	
Secondary education	6	20.0	-	-	-	-	6	20.0	
Graduate	-	-	-	-	-	-	-	-	
Post graduate	-	-	-	-	-	-	-	-	
History of co- morbid illness									
Yes	30	100	-	-	-	-	30	100	0 Df=2 NS
No	-	-	-	-	-	-	-	-	
If yes									
Cardio vascular disease	17	56.6	-	-	-	-	17	56.6	13.56 Df=6 S*
Diabetes mellitus	7	23.4	-	-	-	-	7	23.4	
Respiratory disease	1	3.4	-	-	-	-	-	-	
Others	5	16.6	-	-	-	-	5	16.6	
Current treatment for co-morbid illness.									
Yes	30	100	-	-	-	-	30	100	0 Df=2 NS
No	-	-	-	-	-	-	-	-	

Demographic Variables	Sample (n)		Falls Efficacy						Chi Square x^2 Value P<0.05
	No	%	16-19		20-27		28-64		
			No	%	No	%	No	%	
History of previous falls									
Yes	13	43.4	-	-	-	-	13	43/4	2.55 Df=2 **NS**
No	17	56.6	-	-	-	-	17	56.6	
If yes, Frequency									
Below 5	13	100	-	-	-	-	13	100	0 Df=6 **NS**
Below 6 – 10	-	-	-	-	-	-	-	-	
Between 11-15	-	-	-	-	-	-	-	-	
Above 15	-	-	-	-	-	-	-	-	
Period of fall									
Early morning	6	53.8	-	-	-	-	6	53.8	3.474 Df=6 **NS**
Afternoon	3	23.1	-	-	-	-	3	23.1	
Evening	4	23.1	-	-	-	-	4	23.1	
Night	-	-	-	-	-	-	-	-	
Treatment taken for previous fall									
Native treatment	8	61.6	-	-	-	-	8	61.6	2.034 Df=6 NS
Primary health centre	-	-	-	-	-	-	-	-	
Private hospital	5	38.4	-	-	-	-	5	38.4	
Specialty hospital	-	0	-	-	-	-	-	-	

Note *statistically significant (p<0.05)

Table 17 Shows association between post test scores of Falls efficacy and the selected demographic variables

The 'Chi' square value of the demographic variables such as BMI, education, co-morbid illness are significant at $p < 0.05$ level. None of the other demographic variables such as age, sex, history of co- morbid illness, treatment, history of falls, frequency, time period and treatment obtained for falls were Significant at $p < 0.05$ level. Hence, it was interpreted that the difference in mean score was true difference and not by chance and the hypothesis H_6 was accepted.

CHAPTER -V

DISCUSSION

The present study was designed to evaluate the effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy among elderly in a selected old age home, Vellore. Purposive sampling technique was used. The elderly selected for the study was 30 . The 30 elderly, selected was divided into two groups A and B. Both groups have 15 elderly each , in which group A had interventions on Monday, Wednesday , Friday and group B had intervention on Tuesday, Thursday and Saturday. The intervention included strengthening, balancing and flexibility exercises termed as Tailored exercise program. The intervention was demonstrated by the researcher and it was redemonstrated by the elderly, later exercises were conducted for 30 minutes (two minutes for each exercise) under researcher's supervision. Intervention was given three times a week for a period of 5 weeks. Post test was conducted by the researcher after 5 weeks of tailored exercise program.

The first objective was to assess the levels of physical performance, mobility and falls efficacy before tailored exercise program among elderly.

The data identified from the present study shows that the pretest mean value of physical performance was 23, where it shows that the physical performance is decreased in elderly people.

These study findings were supported by **Graziano Onder (2012)** where he assessed the Physical Performance using physical performance scale**.** The incidence of progressive and catastrophic disability was assessed in a 3 month period in 60 elderly people. Four-meter walking speed, balance, and chair stands tests were used to evaluate lower extremity function through physical performance test. The putting-on-blouse test, picking penny from floor, and grip strength were used to assess upper extremity function. All lower and upper extremity measures, with the exception of grip strength, significantly predicted the level of physical performance. The physical performance measures evaluated had a greater predictive ability for fall. Physical performance were reduced with increasing age, with the average mean of 22 (SD 1.14) and they have about 50% reduction in physical performance with age. The researcher observed when there was less physical performance there is high risk of falls.

The data identified from the present study shows that the pretest mean value of elderly mobility 16 out of 20 which was measured by Elderly Mobility Scale.

This study was supported by **Claire Peel (2011)** , who assessed mobility in older adults. Subjects were selected as a stratified random sampled from 998 Medicare beneficiaries aged ≥65 years. The Elderly mobility scale was used to assess physical performance and mobility. Simple bivariate correlations (r=2.78) indicated a significant decrease in mobility with aging**.** The study showed that mobility decreased with increasing age. Routine activities of daily living enhanced mobility compared with activity restricted elders. The scores obtained bivariate correlations (r=2.78) can be used in combination with other tests and measures to generate clinical hypotheses to explain mobility deficits and to plan appropriate interventions to address these deficits.

The data identified from the present study shows that the pretest mean value of falls efficacy which is 28 of total score of 64 which was measured by Falls efficacy Scale. It shows that falls efficacy is decreased in elderly people, so measures are to be taken to increase falls efficacy.

This study was supported by **Mary. E Thompson (2014)** who measured the level of falls efficacy as a measure of fear of falling. The researcher used Falls Efficacy Scale (FES). 100 Subjects who reported avoiding activities because of fear of falling had less FES scores, 50% (50) have average mean of 28 and (SD 1.48) representing lower self-efficacy or confidence, than subjects not reporting fear of falling. The independent predictors of FES score were usual walking pace (a measure of physical ability), anxiety, and depression. This was useful in assessing the independent contribution of fear of falling to functional decline among elderly people and it showed that elderly had a fear of falling with increased age.

The second objective is to assess the effectiveness of Tailored exercise programme on levels of physical performance, mobility and falls efficacy.

The data identified from the present study shows that Tailored Exercise program was effective on Physical performance, mobility and falls efficacy among elderly in a selected Old age home, Vellore.

The study findings revealed that the pre test mean value of physical performance was 23 and after the tailored exercise program the post test mean value was 24.7. The mean difference was 1.7. The paired "t" value (3.3) was greater than the table value (2.76) which was statistically significant at 'p' >0.01 level, proving effectiveness of tailored exercise program on physical performance. Hence hypothesis H_1 was accepted.

The study findings of elderly mobility revealed that the pre test mean value was 16 and after the exercise program the post test mean value was 17. The mean difference was 1. The paired "t" value (5.3) is greater than the table value (3.66) which was statistically significant at 'p' <0.001 level proving effectiveness of tailored exercise program on Elderly mobility. Hence hypothesis H_2 was accepted.

The study findings reveal that the pre test mean value of falls efficacy was 28 and after the exercise program the post test mean value was 43.7. The standard deviation was 5.62 in pre test and 4.17 in post test. The paired "t" value (12.7) is greater than the table value (3.66) which was statistically significant at $p < 0.001$ level proving effectiveness of tailored exercise program on Falls efficacy. Hence hypothesis H_3 was accepted.

This study was supported by **Eduardo Lusa Cadore (2012)** in which he stated that Effects of Different Exercise Interventions such as strengthening and flexibility exercise improves Gait Ability, balance and Performance in Physically Frail Older Adults. He conducted study in 50 elderly residing in selected old age homes, Ontario. Strengthening and flexibility exercise was given 3 times a week for 6 weeks. There was a significant difference in physical performance, mobility significant at $p < 0.05$ level, 't' value (4.7). So the study concluded exercise program is effective on gait ability, balance and physical performance.

Maria Justine (2011) conducted a study to evaluate the Effects of Multicomponent Exercise Training (strengthening, flexibility and balance) on Physical Functioning among elderly in old age home. This study aimed to measure the effects of 7 week multicomponent exercise training on physical functioning mobility and falls risk among 60 institutionalized elderly.

Lower limb strength, upper and lower limb flexibility, balance, and mobility were assessed. The training resistance, balance and flexibility exercises, were performed 3 times per week. There was a significant difference in physical functioning at $p<0.05$ level ,'t' value (5.6). The data suggested that 7 week multicomponent exercise training improves physical functioning, mobility and thus decreasing falls risk among elderly.

The study was supported by **C.M Arnold (2013)** in which he measured the effects of exercise in improving physical performance and increasing the falls efficacy. Physical performance was measured by physical performance scale and falls efficacy by Falls efficacy scale. The study was done with 55 elderly with high risk of falls and had 8 weeks of balance and strengthening exercises. The results showed that the participants demonstrated significantly ($p<0.05$) ('t'=3.7) greater improvement in balance and falls efficacy. Researcher concluded that Falls-efficacy screening may be important for decisions regarding referral to fall-prevention programmes.

The third objective is to associate the post test level of physical performance, mobility and falls efficacy with the selected demographic variables among elderly.

The data identified from the present study showed that the post test level of physical performance, mobility and falls efficacy were associated with the selected demographic variables among elderly.

In physical performance the 'Chi' square value of demographic variable, history of falls is significantly associated at $p<0.05$ level. Hence hypothesis H_4 was accepted

In elderly mobility the 'Chi' square value of demographic variables such as history of falls and period of falls are significantly associated at $p < 0.05$ level. Hence hypothesis H_5 was accepted

In falls efficacy the 'Chi' square value of demographic variables such as BMI, education, co-morbid illness are significantly associated at $p < 0.05$ level . Hence hypothesis H_6 was accepted

The study was supported by **Abhay B. Mane (2014)** who conducted a descriptive study to assess the Prevalence and correlates of fear of falling among elderly population in urban area of Karnataka. 150 elderly subjects above 60 years were randomly selected from urban area and interviewed for fear of falls (FOF) using Short Fall Efficacy Scale-I (FES-I), history of falls and risk factors. The prevalence of FOF among the elderly was 33.2%. The significant correlates of FOF were educational status, family type, associated health problems, history of fall in past 6 months, worried of fall again among fallers, fearfulness of fall again among fallers, restriction of daily activities and depression which was significant at $p < 0.05$ level. The insignificant correlates were gender and socio-economic status.

The study was supported by **Grant H Louie (2011)** he conducted a cross sectional study to assess the level of physical performance and elderly mobility using elderly mobility scale and physical performance scale on elderly aged ≥ 60 years ($N = 150$) from old age home, Neveda, United States . From the repeated chair rise test, sitting to standing and lying to sitting self-reported difficulty was addressed by elderly. The demographic variables such as BMI, history of falls, co morbidities. Lower education level gender were associated at $p < 0.05$ level with self-reported limitations of the task.

CHAPTER VI

SUMMARY AND RECOMMENDATIONS

In this chapter, the summary of the study, conclusions, implications and recommendations for further researches are presented. This chapter gives the brief results of the study with the future recommendations.

A. SUMMARY OF THE STUDY

The study was conducted to determine the effectiveness of Tailored Exercise program on Physical Performance, Mobility and Falls Efficacy among Elderly in a selected old age home, Vellore. Pre experimental design study was used for this study. The conceptual framework of this research was based on Ernestine Wiedenbach's theory (1964) .The instrument used for data collection was structured questionnaires to assess demographic variables, Physical Performance, Mobility and Falls Efficacy which included a pretest and post test measure. Samples of 30 were selected by purposive sampling technique. Descriptive statistics (frequency, percentage, mean, standard deviation) and inferential statistics (paired't' test and chi-square) were used to analyze the data to test the study hypotheses.

The study findings are summarized below.

The effectiveness of Tailored exercise on Physical Performance was assessed by comparing Pre and Post test scores.

The study findings revealed that the pre test mean value was 23 and after the tailored exercise program the post test mean value was 24.7. The mean difference was 1.7. The standard deviation was 3.60 in pre test and 2.44 in post test.

The paired “t" value (3.3) is greater than the table value (2.76) which was statistically significant at 'p' <0.01 level proving effectiveness of tailored exercise program on physical performance. Hence the hypothesis H_1 is accepted and the differences between pre and post test score of physical performance were true difference thus it is interpreted that the tailored exercise was effective in improving physical performance.

The ‘Chi’ square value of the demographic variable history of falls (9.045) is significant p level at <0.05. The demographic variable such as age, sex, BMI, education, history of co- morbid illness, Current treatment for illness, falls frequency, period and treatment for falls are not Significant at 'p' <0.05 level . Hence, it was interpreted that the difference in mean score was true difference and not by chance and the hypothesis H_4 was accepted.

The effectiveness of Tailored exercise on elderly mobility was assessed by comparing Pre and Post test scores.

The study findings reveal that the pre test mean value was 16 and after the exercise program the post test mean value was 17. The mean difference was 1. The standard deviation was 1.15 in pre test and 1.42 in post test. The paired "t" value (5.3) was greater than the table value (3.66) which was statistically significant at 'p' <0.001 level, proving effectiveness of tailored exercise program on Elderly mobility. Hence the hypothesis H_2 is accepted and the difference between pre and post test score of elderly mobility was true difference. Thus it is interpreted the tailored exercise was effective in improving elderly mobility.

The ‘Chi’ square value of demographic variables such as sex (6.58) history of falls (6.374) and period of falls (13.048) are significant at 'p' <0.05 level. The demographic variable such as age, BMI, education, history of co- morbid illness, current treatment, frequency, period and treatment for falls are not significant at ' p' <0.05 level. Hence, it was interpreted that the difference in mean score was true difference and not by chance and the hypothesis H_5 was accepted.

The effectiveness of Tailored exercise on Falls efficacy was assessed by comparing Pre and Post test scores.

The study findings reveal that the pre test mean value was 28 and after the exercise program the post test mean value was 43.7. The mean difference was 15.7. The standard deviation was 5.62 in pre test and 4.17 in post test. The paired "t" value (12.7) is greater than the table value (3.66) which was statistically significant at 'p' <0.001 level proving effectiveness of tailored exercise program on falls efficacy. Hence the hypothesis H_3 is accepted and the difference between pre and post test score of falls efficacy were true difference thus it is interpreted the tailored exercise was effective in improving falls efficacy.

The ‘Chi’ square value of demographic variables such as BMI (13.092), education (15.886), co-morbid illness (13.56) are significant are significant at 'p' <0.05 level. The demographic variables such as age, sex, history of co- morbid illness, treatment, history of falls, frequency, period and treatment taken for falls are not Significant at 'p' <0.05 level. Hence, it was interpreted that the difference in mean score was true difference and not by chance and the hypothesis H_5 was accepted.

B.CONCLUSION:

The following conclusions were made from the study findings. Majority of the participants showed improvement in physical performance, mobility and falls efficacy. There is a significant change in physical performance, mobility and falls efficacy among elderly. The findings of the study were consistent with the review of literature and based on the method of sample selection supports the study. These findings may be generalized to elderly in home environment and hospital environment.

C. NURSING IMPLICATIONS:

The findings of the study have implications in the field of Nursing Practice, Nursing Education, Nursing Administration and Nursing Research.

NURSING PRACTICE:

- Staffs can be trained to assess the elderly and provide tailored exercises in hospital, nursing homes and rehabilitation centers.
- Elderly can be motivated to practice exercises to prevent falls and improving muscle strength in clinical areas and in old age homes.

NURSING EDUCATION:

- The practice and benefits of tailored exercises could be introduced in the curriculum (Gerontology) as a preventive aspect for fall and improving their physical activities.

- Nurse educators should conduct practice sessions on Tailored exercises through inservice education to prevent elderly complications due to falls.

- Nurse administrator can conduct practice sessions on Tailored exercises through in service education

NURSING ADMINISTRATION:

- Nurse administrator can formulate policies and protocols on routine tailored exercises in Geriatric unit, nursing homes and rehabilitation centre.

- Nurse administrator should train more geriatric nurses and to practice tailored exercise to improve their physical performance and prevent falls in old age homes.

NURSING RESEARCH:

- Future studies can be conducted on effect of Tailored exercises on Elderly for longer duration and elderly using assistive devices for daily activities.

D. RECOMMENDATIONS FOR FURTHER RESEARCH

On the basis of the study that had been conducted, suggestions are given for future studies:

- A similar study can be performed with longer period of time of tailored exercise program to draw generalizations.

- A similar study can be performed with larger samples.

- A comparative study can be conducted to evaluate the effect of tailored exercise program and tailored exercise program with nutritional supplement (calcium) among elderly.

- A comparative study can be conducted to evaluate the effect of tailored exercise program with other type of exercises such as calisthenic exercise, Tai chi exercise.

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APPENDIX- A

Letter seeking request to conduct Pilot study.

Om Namo Narayani

SRI NARAYANI COLLEGE OF NURSING

(A Unit of Sri Narayani Hospital & Research Centre)
Sripuram, Thirumalaikodi, Vellore - 632 055.
Vellore District, Tamilnadu. India.

Dr. N.BALAJI, Ph.D., FIMSA, FACSc.
Director

30.06.2015

To,

The President,
Thanjam Old Age Home,
C/O. Organization For Rural Develepment (ORD),
Ariyur , Vellore.

Respected sir,

sub: Requesting permission for conducting the research pilot studty in Thanjam Old Age Home

This is for your information that, Miss. Persis Angelin .W, II year M.Sc (N) student at Sri Narayani College of Nursing is planning a research pilot study on **'Effectiveness of Tailored exercise program on levels of Physical performance, Mobility and Falls efficacy among elderly in a selected old age home, Vellore'**, to be submitted to The Tamil Nadu Dr. MGR Medical University as partial fulfillment for awarding the degree of M.Sc Nursing . Hence forth, I request your good selves to kindly accord permission for data collection from elderly residing at Thanjam Old Age Home. She Will abide by the rules and regulations, as Stipulated.

.Kindly do the needful

Thanking you,

PRINCIPAL

PRINCIPAL
SRI NARAYANI COLLEGE OF NURSING
VELLORE - 55.

Phone : 0416 - 2270225, 2270224, Fax : 0416 - 2270224
E-mail : aosnc@snhrc.org

APPENDIX- B

Letter seeking request to conduct Main study.

Om Namo Narayani

SRI NARAYANI COLLEGE OF NURSING

(A Unit of Sri Narayani Hospital & Research Centre)

Sripuram, Thirumalaikodi, Vellore - 632 055.
Vellore District, Tamilnadu. India.

Dr. N.BALAJI, Ph.D., FIMSA, FACSc.
Director

27.06.2015

To

The Manager,

Mahatma Gandhi Old Age Home,

Arcot, Vellore.

Respected Sir,

Sub : Request regarding conducting the Research Dissertation in Mahatma Gandhi Old Age Home.

This is for your information that, **Miss. Persis Angelin.W, II year M.Sc (N)** student at Sri Narayani College of Nursing is planning a research dissertation on **"Effectiveness of Tailored exercise program on levels of physical performance, Mobility and Falls efficacy among elderly in a selected old age home in Vellore "**, to be submitted to **The Tamil Nadu Dr. MGR Medical University** as partial fulfillment for awarding the degree of M.Sc Nursing. I request to allow her to conduct this research dissertation at Mahatma Gandhi old age home, Arcot. She will abide by the rules and regulation, as stipulated.

Kindly do the needful

Thanking you

Lalitha. P.
ADMINISTRATIVE OFFICER
SRI NARAYANI COLLEGE OF NURSING
THIRUMALAIKODI,
VELLORE - 632 055.

Phone : 0416 - 2270225, 2270224, Fax : 0416 - 2270224
E-mail : aosnc@snhrc.org

APPENDIX-C

Letter granting permission to conduct main study.

From,

The President / Secretary,

Mahatma Gandhi Old age home,

Arcot , Vellore- 632 503.

To ,

The administrative officer,

Sri Narayani College of Nursing,

Vellore- 632 055.

Respected madam,

Sub: Granting permission to conduct research in Mahatma Gandhi Old Age Home.

I have noticed the information regarding the request for conducting the research study in Old Age home by Miss. Persis Angelin of IIyear M.Sc Nursing. I hereby grant permission to conduct the study on our above mentioned institution and we expect her to abide the rules and regulations.

Thanking you.

Date: 2/7/2015.

Place: Vellore.

Your's sincerely,

President
(Free Old Age Home)
Mahathma Gandhi Trust
ARCOT-632 503 V.Dt.

APPENDIX- D

CERTIFICATE OF VALIDATION.

This is to certify that the questionnaire (standardized tool) and the demographic variables for the research study **"Effectiveness of Tailored exercise program on levels of Physical performance, Mobility and Falls efficacy among elderly in a selected old age home, Vellore"** prepared by Miss. Persis Angelin.W has been validated.

Name :

Designation :

Institution :

Signature :

Date :

APPENDIX-E

Letter requesting participation in the study

Dear participant,

I, **Miss.Persis Angelin. W** , IInd year M.Sc Nursing student of Sri Narayani College of Nursing, am conducting a research dissertation on **" Effectiveness of Tailored exercise program on levels of Physical performance, Mobility and Falls efficacy among elderly in a selected Old age home ,Vellore",** as a partial fulfillment of my Masters Degree. In this regard I would like to demonstrate exercises and collect data to improve your Physical performance, Mobility and Falls efficacy. I assure you that the information obtained from you will be strictly confidential and will be used for the study purpose only. I need your whole-hearted cooperation in this study to gather information and I will be grateful to you for the same.

Thanking you in anticipation,

Yours sincerely,

Miss.Persis Angelin.W

CONSENT

I have been informed for the purpose of the study and agree to participate in the same.

Date :

Place :

Signature of participant

APPENDIX-F

List of experts for Tool validation.

1. **Prof. Mrs. Beulah Premkumar MSc(N)., Ph.D,**

   Department of Medical and Surgical Nursing,

   Christian Medical College,

   Vellore, Tamil Nadu.

2. **Prof. Mrs. Anbu Surendra Kumar MSc(N).,**

   Department of Medical and Surgical Nursing,

   Christian Medical College,

   Vellore, Tamil Nadu.

3. **Mrs. Devanithi, M.SC (N),**

   Principal, Head of Medical Surgical Nursing,

   Mythiri College of Nursing,

   Shimoga, Karnataka.

4. **Mr. Muthurathinam, M.Sc,Biostatistics .,**

   Biostatistican,

   Sri Narayani College of Nursing,

   Vellore, Tamil nadu.

APPENDIX-G

Certificate of English editing.

To whomsoever it may concern

This is to Certify that Miss. Persis Angelin.W, II M.Sc Nursing, Department of Medical Surgical Nursing has to conduct the dissertation for the partial fulfillment of Master Degree course "**Effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy among elderly in a selected old age home , Vellore"**. She has prepared the tool and content. It has been edited by me in English language.

VOORHEES HR. SEC. SCHOOL VELLORE 632 001.

19/1/16.

Signature of the editor

E. FELIX, B.Sc., M.Ed., D.Com.,
AHM, B.T. Assistant (Science)
Voorhees Higher Secondary School,
VELLORE - 632 001.

APPENDIX – H

CERTIFICATION OF TAMIL EDITING

To whomsoever it may concern

This is to Certify that Miss. Persis Angelin.W, II M.Sc Nursing, Department of Medical Surgical Nursing has to conduct the dissertation for the partial fulfillment of Degree course "**Effectiveness of tailored exercise program on levels of physical performance, mobility and falls efficacy among elderly in a selected old age home , Vellore"** .She has prepared the tool and content. It has been edited by me in Tamil language.

Signature of the editor

Attested
Dr. B.G. THIRUINBAEZHILAN
M.A., M.Phil., B.Ed., Ph.D.,
Assistant Professor of Tamil
P.G. & Research Department of Tamil
Voorhees College, Vellore - 632 001

APPENDIX -I

Data collection instrument- English.

Part- A Demographic Variables.

1. **AGE (in years)**

   a. 60- 65

   b. 66-70

   c. 71-75

   d. Above 75.

2. **Sex**

   a. Male

   b. Female

3. **BMI**

   a. Below 18

   b. Between 19-24

   c. Between 24-30

   d. Above 30

4. **Education.**

   a. Illiterate

   b. Primary education

   c. Secondary education

   d. Graduate

   e. Post graduate

5. History of comorbid illnesses Yes/ No

If yes,

a. Cardiovascular disease

b. Diabetes mellitus.

c. Respiratory diseases.

d. Others.

6. Current treatment for of co morbid illnesses

a. Yes

b. No

7. History of previous falls.

a. Yes

b. No

7. (a) If yes, Frequency of previous falls

a. Below 5

b. Between 6-10

c. Betwen11-15

d. Above 16

7. (b) Period of previous falls

a. Early morning

b. Afternoon

c. Evening

d. Night

7. (c) Treatment taken for previous falls

a. Native treatment

b. Primary health centre

c. Private hospital

d. Specialty hospital

PART B (a) OBSERVATION CHECKLIST TO MEASURE PHYSICAL ACTIVITY BY

PHYSICAL PERFORMANCE SCALE (BROWNS TOOL 2005)

1.	Standing Static Balance	Feet Together: _____ sec	Semi Tandem: _____ sec	Tandem: _____ sec.	Score	remarks
		10s.	10s.	☐ 10s	☐ 4	
		10s.	10s.	☐ 3-9.9s	☐ 3	
		10s.	10s.	☐ 0-2.9s	☐ 2	
		10s.	. ☐ 0-9s	Unable	☐ 1	
		☐ 0-9s	Unable	Unable	☐ 0	

		Time	**Scoring values**	**Score**	Remarks
2.	Chair rise		≤ 11 sec = 4 11.1--14 sec = 3 14.1--17 sec = 2 >17 sec = 1 unable = 0		
3.	Lift a book and put it on a shelf		≤ 2 sec = 4 2.1--4 sec = 3 4.1-- 6 sec = 2 > 6 sec = 1 unable = 0		
4.	Put on and remove a jacket		≤ 10 sec = 4 10.1 --15 sec = 3 15.1 – 20 sec = 2 >20 sec = 1 unable = 0		
5.	Pick up a penny from floor.		≤ 2 sec = 4 2.1--4 sec = 3 4.1-- 6 sec = 2 > 6 sec = 1 unable = 0		
6.	Turn 360 degrees	Discontinuous steps = 0 Continuous steps = 2			
		Unsteady (grabs, staggers) = 0 Steady = 2			
7.	50-foot walk test. .		≤ 15 sec = 4 15.1--20 sec = 3 20.1--25 sec = 2 >25 sec = 1 unable =		
8.	Climb one flight of stairs.		≤ 5 sec = 4 5.1--10 sec = 3 10.1 – 15 sec = 2 >15 sec = 1 unable = 0		
9.	Climb stairs.	Number of flights of stairs up and down (maximum 4)			
Total score			9- item score	/36	

PART B (b) OBSERVATION CHECKLIST TO MEASURE MOBILITY BY ELDERLY MOBILITY SCALE (SMITHS 1994)

Task		Pre-test	Post - test	remarks
Lying to sitting	**2** Independent **1** Needs help of 1 person **0** Needs help of 2+ people			
Sitting to lying	**2** Independent **1** Needs help of 1 person **0** Needs help of 2+ people			
Sitting to standing	**3** Independent in under 3 seconds **2** Independent in over 3 seconds **1** Needs help of 1 person (verbal or physical) **0** Needs help of 2 + people			
Standing	**3** Stands without support & reaches within arms length **2** Stands without support but needs help to reach **1** Stands, but requires support **0** Stands, only with physical support (1 person) Support = uses upper limbs to steady self			
Gait	**3** Independent (incl. use of sticks) **2** Independent with frame **1** Mobile with walking aid but erratic/ unsafe turning **0** Requires physical assistance or constant supervision			
Timed walk (6 metres)	**3** Under 15 seconds **2** 16-30 seconds **1** over 30 seconds			
Functional reach	**4** Over 20cm **2** 10-20cm **0** Under 10cm or unable			
		/20	**/20**	

PART C (c) QUESTIONAIRE ON PREVENTION OF FALLS THROUGH FALLS EFFICACY SCALE (TINNETE'S 1990)

		Not at all concerned 1	Somewhat concerned 2	Fairly concerned 3	Very concerned 4	Remarks
1	Cleaning the house (for example, sweep, vacuum or dust)	1 ☐	2 ☐	3 ☐	4 ☐	
2	Getting or undressed	1 ☐	2 ☐	3 ☐	4 ☐	
3	Preparing simple meals	1 ☐	2 ☐	3 ☐	4 ☐	
4	Taking bath or shower	1 ☐	2 ☐	3 ☐	4 ☐	
5	Going shopping	1 ☐	2 ☐	3 ☐	4 ☐	
6	Getting in and out of chair	1 ☐	2 ☐	3 ☐	4 ☐	
7	Going up or downstairs	1 ☐	2 ☐	3 ☐	4 ☐	
8	Walking around in the neighborhood	1 ☐	2 ☐	3 ☐	4 ☐	
9	Reaching for something above your head or on the ground	1 ☐	2 ☐	3 ☐	4 ☐	
10	Going to answer the telephone before it stops ringing	1 ☐	2 ☐	3 ☐	4 ☐	
11	Walking on a slippery surface(for example, wet or icy)	1 ☐	2 ☐	3 ☐	4 ☐	
12	Visiting a friend or relative	1 ☐	2 ☐	3 ☐	4 ☐	
13	Walking in a place with crowds	1 ☐	2 ☐	3 ☐	4 ☐	
14	Walking on an uneven surface(for example rocky ground, poorly maintained pavement)	1 ☐	2 ☐	3 ☐	4 ☐	
15	Walking up or down a slope	1 ☐	2 ☐	3 ☐	4 ☐	
16	Going out to a social event(for example, religious service, family gathering or club meeting)	1 ☐	2 ☐	3 ☐	4 ☐	
		Add all 1's	Add all 2's	Add all 3's	Add all 4's	

APPENDIX-J

பகுதி-அ

ஆய்வில் பங்கேற்பர்வரின் விவரங்கள்

1. வயது

அ) 60 – 65

ஆ) 66 – 70

இ) 71 – 75

ஈ) 75 வயதிற்க்கு மேல்

2. பாலினம்

அ) ஆண்

ஆ) பெண்

3. உடல் பொருண்மை எண்

அ) 18 க்கும் குறைவாக

ஆ) 19 முதல் 24 வரை

இ) 25 முதல் 30 வரை

ஈ) 30 க்கும் மேல்

4. கல்வி தகுதி

அ) படிக்காதவர்

ஆ) இளநிலைக் கல்வி

இ) மேல்நிலைக் கல்வி

ஈ) பட்டதாரி

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5. நோய் பாதிப்பின் வரலாறு. ஆம் / இல்லை, ஆம் என்றால்.

அ) இருதய நோய்கள்

ஆ) நீரிழிவு நோய்

இ) சுவாச நோய்

ஈ) மற்ற நோய்கள்

6. நோயிற்காக தற்பொழுது சிகிச்சை பெறுகிறீர்களா?

அ) ஆம்

ஆ) இல்லை

7. இதற்கு முன் விழுந்தது உண்டா ? ஆம் / இல்லை, ஆம் என்றால்.

1. எத்தனை முறை

அ) 5 முறைக்கும் கீழ்

ஆ) 6-10 வரை

இ) 11-15 வரை

ஈ) 16 முறைக்கும் மேல்

2. கால நேரம்

அ) அதிகாலை

ஆ) மதியம்

இ) மாலை

ஈ) இரவு

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3. சிகிச்சை பெற்றவை

அ) நாட்டு மருத்துவம்

ஆ) ஆரம்ப சுகாதார நிலையம்

இ) தனியார் மருத்துவமனை

ஈ) எலும்பு சிறப்பு வைத்தியசாலை

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பகுதி - ஆ

விழும் பலாபலன் அளவுகோல் / விழும் ஆபத்து மதிப்பீடு கருவி

நான் உங்களிடத்தில் வீழ்ச்சி இயலக்கூடியதைக் குறித்து எவ்வளவு அக்கறையாக உள்ளீர்கள் என்பதைக் கேட்கப்போகிறேன். ஒவ்வொரு வேலைகளுக்கும் எவை உங்கள் கருத்துக்களுக்கு நெருக்கமாக உள்ளதோ அதை வட்டமிடவும். நீங்கள் பதிலளிக்கும் போது அந்த வேலைகளை எவ்வாறு செய்வீர்கள் என்பதனை நினைத்து பதிலளிக்கவும். கீழ் குறிப்பிட்ட வேலைகளை இப்பொழுது செய்யவிட்டாலும் வீழ்ச்சி இயலக்கூடியதைக் குறித்து எவ்வளவு அக்கறை இருக்கிறது என்பதை அந்த வேலை செய்ததாக நினைத்து பதிலளிக்கவும்

வ. எண்	பொருளடக்கம்	அக்கறை இல்லை	ஓரளவு அக்கறை யுள்ளது	மிகவும் அக்கறை யுள்ளது	பெரிதளவில் அக்கறை யுள்ளது
1.	வீட்டை சுத்தப்படுத்தும் போது				
2.	ஆடையை அணியும் போது அல்லது கழற்றும் போது				
3.	எளிமையான உணவை சமைக்கும் போது				
4.	குளிக்கும் போது				
5.	கடைக்கு செல்லும் போது				
6.	நாற்காயில் உட்காரும் மற்றும் எழுந்திருக்கும் போது				
7.	மாடிப்படி ஏறும் போது (அ) இறங்கும் போது				
8.	சுற்றுப்புறத்தில் நடக்கும் போது				
9.	தலைக்கு மேலே அல்லது கீழே உள்ள பொருளை எடுக்கும் போது				

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10.	தொலைபேசி அழைப்புமணி முடிவதற்குள் எடுக்க செல்லும் போது				
11.	வழவழப்பான பாதையில் நடக்கும் போது				
12.	நண்பர்களை மற்றும் உறவினர்களைப் பார்க்கும் போது				
13.	கூட்ட நெரிசலான இடங்களில் செல்லும் போது				
14.	கரடுமுரடான பாதையில் செல்லும் போது				
15.	சரிவுகளில் ஏறும்போது அல்லது இறங்கும் போது				
16.	சமூக நிகழ்வுகளுக்கு செல்லும் போது				
மொத்த மதிப்பெண்					

கோல் : குறைந்த அக்கறை 16-19. மிதமான அக்கறை 20-27. உயர் அக்கறை 28-64

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APPENDIX- K

Tailored exercises are done to improve health and mobility..

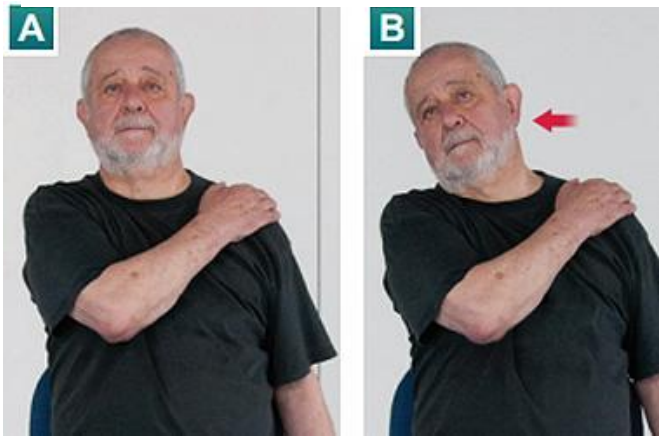
Wear loose, comfortable clothing and keep some water handy. Build up slowly and aim to gradually increase the repetitions of each exercise over time. These exercises should be done at least twice a week and combine them with the other routines in this series to help improve strength, balance and co-ordination. these exercises should be done six times each holding for five seconds and return to the starting position.

FLEXIBILITY EXERCISES

NECK ROTATION

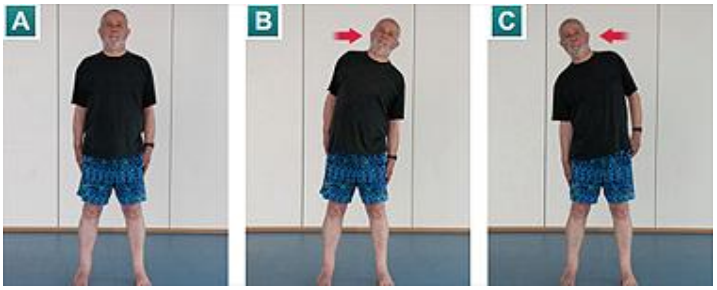
This stretch is good for improving neck mobility and flexibility.

NECK STRETCH



This stretch is good for loosening tight neck muscles.

SIDEWAYS BEND



This stretch will help restore flexibility to the lower back.

CALF STRETCH

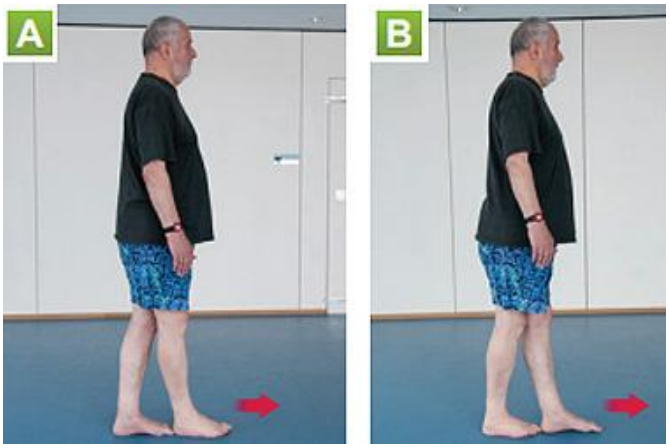
This stretch is good for loosening tight calf muscles.

BALANCE EXERCISES

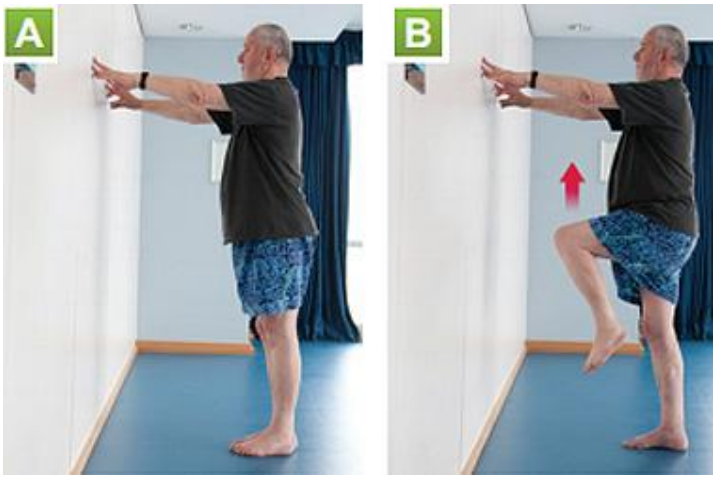
SIDEWAYS WALKING

SIMPLE GRAPEVINE

HEEL-TO-TOE WALK.



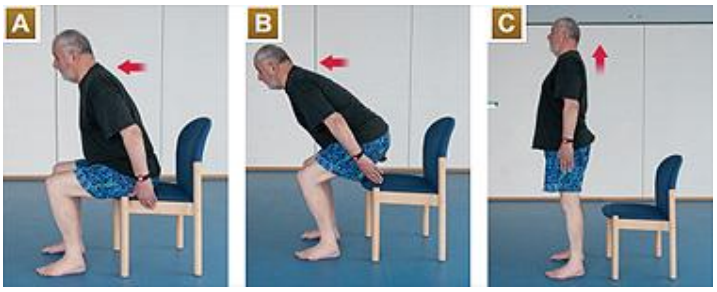
ONE-LEG STAND



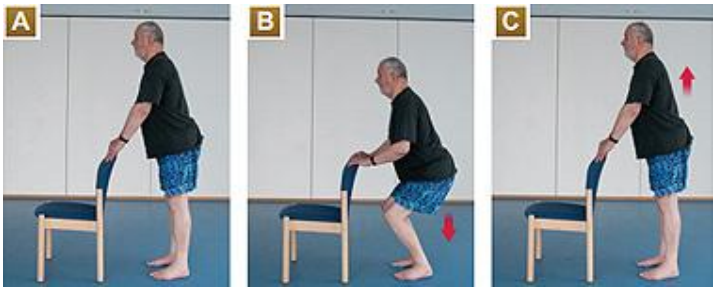
STEP-UP

STRENGTHENING EXERCISES.

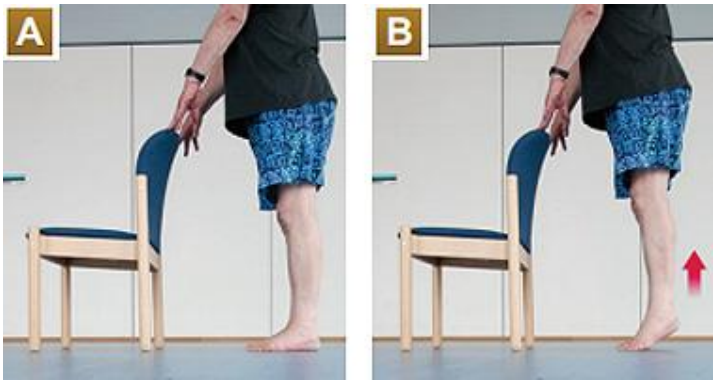
SIT-TO-STAND



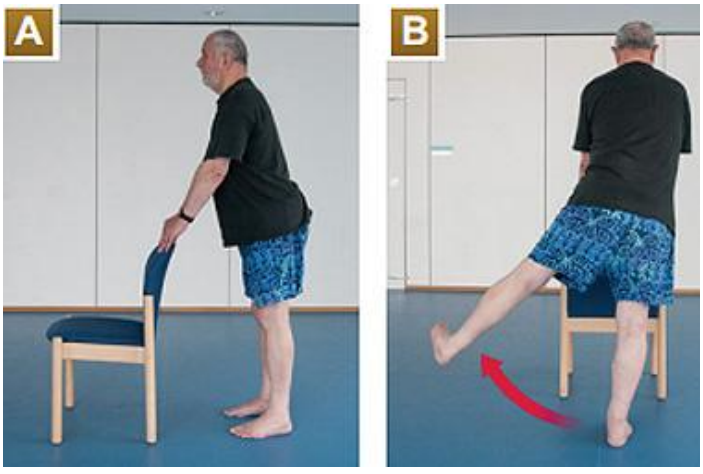
MINI-SQUATS



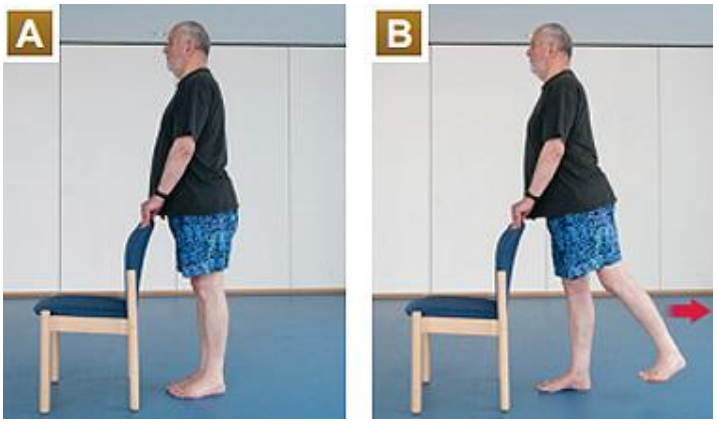
CALF RAISES



SIDEWAYS LEG LIFT



LEG EXTENSION



WALL PRESS-UP